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The University of Iowa General Catalog 1978-80

University of Iowa

Comments
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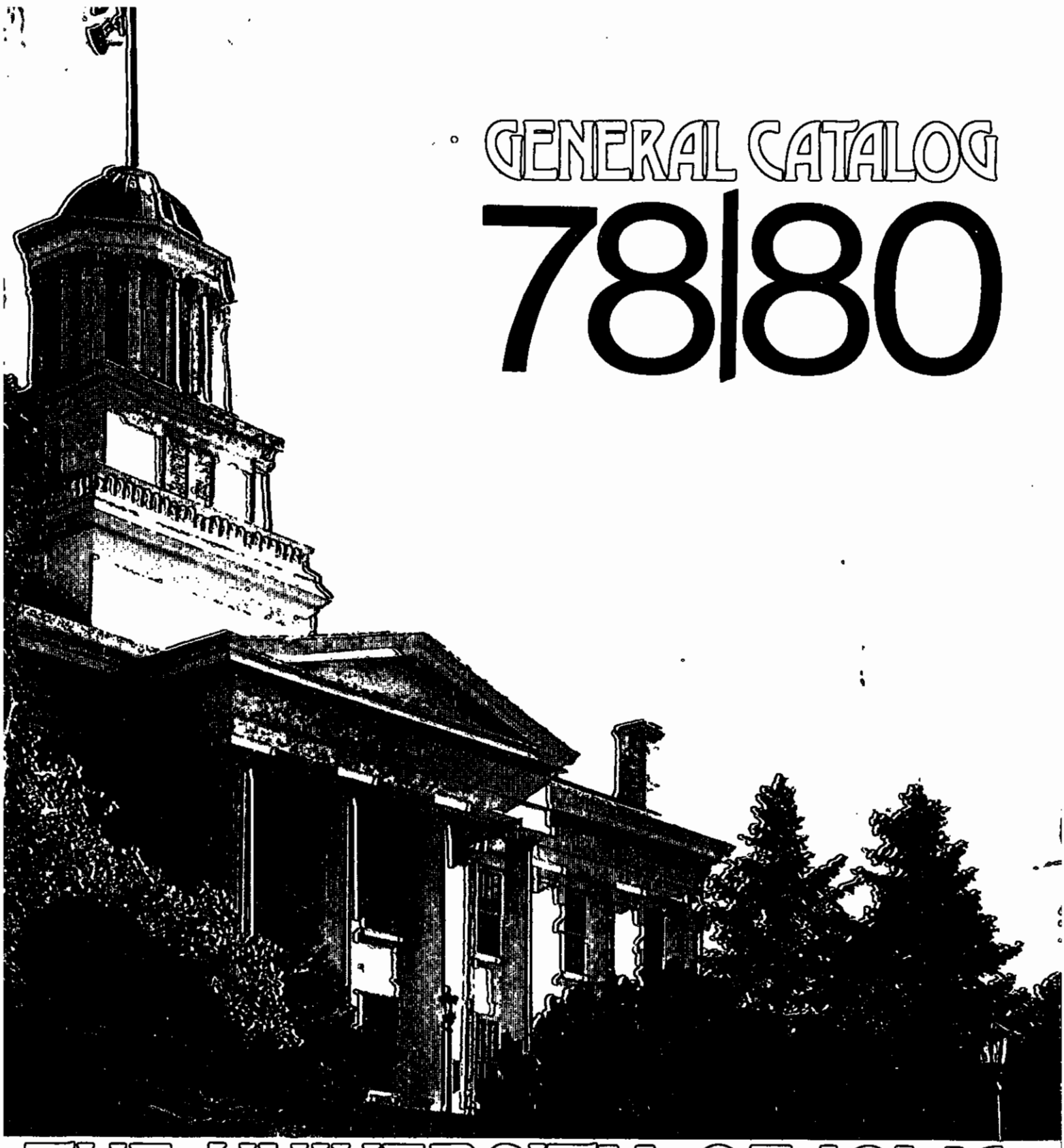
GENERAL CATALOG

78|80



THE UNIVERSITY OF IOWA

The University of Iowa General Catalog 1978-80

New Series No. 2132
August 1, 1978
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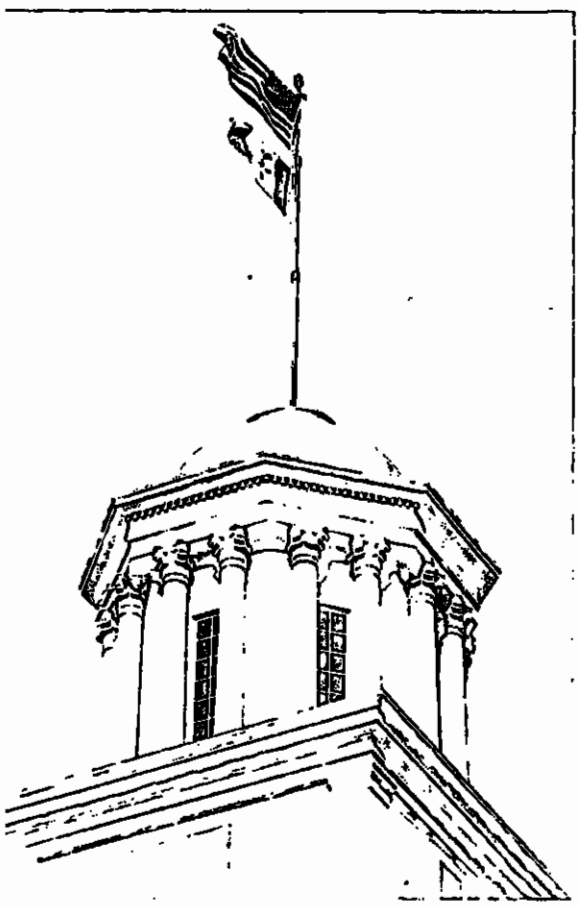
Copies of this *Catalog* are available for examination in all Iowa high schools, offices of the county superintendents of schools, public libraries and junior and community colleges; at the major state government offices in Des Moines; and in each office of the University. Copies may be requested from the Office of Admissions without charge. Reprints of individual sections of the *Catalog* are also available without charge. This *Catalog* is published for informational purposes and should not be construed as the basis of a contract between a student and The University of Iowa. Every effort is made to provide information that is accurate at the time the catalog was prepared. However, information concerning regulations, policies, fees, curricula, courses, and other matters contained in this *Catalog* is subject to change at any time during the period for which the catalog is in effect. Current information regarding fees, important dates and the availability of courses can be found in the schedule of courses that is available before each term or by request from the Office of Admissions.

University Calendar



First Semester	1978-79	1979-80
Advising and counseling	August 28	August 27
Registration begins	August 29	August 28
Classes begin	August 31	August 30
University holiday	September 4	September 3
Homecoming	October 28	
Thanksgiving recess	November 22	November 21
University holiday	November 23	November 22
	November 24	November 23
Classes resume	November 27	November 26
Classes end	December 15	December 14
Examination Week begins	December 18	December 17
Examination Week ends	December 22	December 21
Commencement	December 22	December 22
University holiday	December 25-26	December 24-25
University holiday	January 1	January 1

Second Semester	1978-79	1979-80
Registration begins	January 18	January 17
Classes begin	January 22	January 21
Spring vacation begins	March 23	March 21
Classes resume	April 2	March 31
Classes end	May 11	May 9
Examination Week begins	May 14	May 12
Examination Week ends	May 18	May 16
Commencement	May 19	May 17
University holiday	May 28	May 26

Summer Session	1979	1980
Registration	June 4	June 9
Classes begin	June 5	June 10
University holiday	July 4	July 4
Summer Session ends	July 27	August 1
Commencement	July 27	August 1
Independent Study Unit opens for Law and Graduate students	July 30	August 4
Independent Study Unit ends	August 24	August 2
University holiday	September 3	September 1

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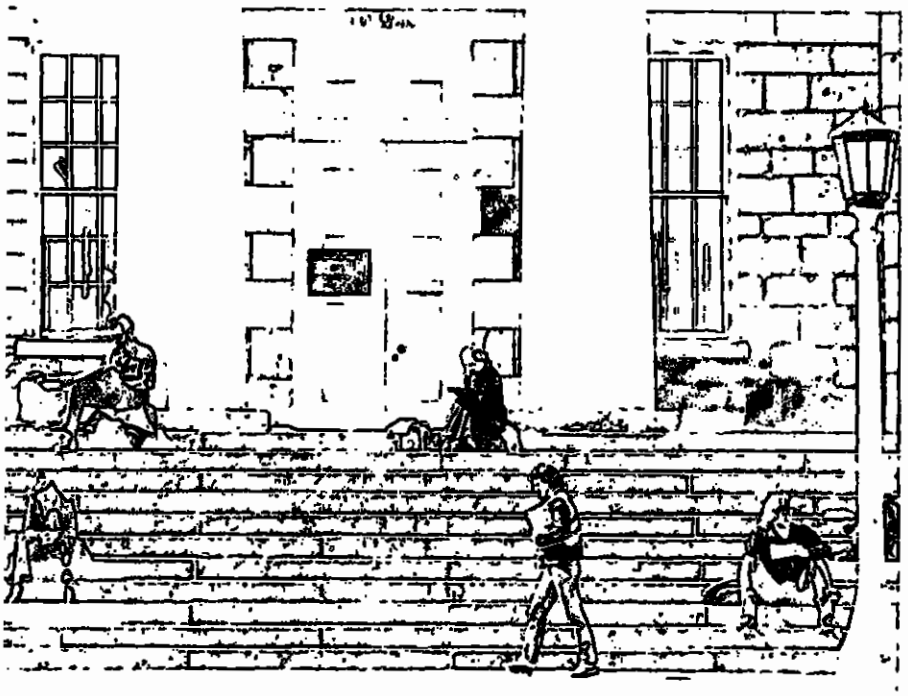


General Information

The University of Iowa is one of Iowa's three state universities. The core of the University is the College of Liberal Arts. Within the College there are seven schools: Art and Art History, Journalism, Letters, Library Science, Music, Religion, and Social Work. The College of Liberal Arts is closely linked with the professional colleges of Business Administration, Dentistry, Education, Engineering, Law, Medicine, Nursing and Pharmacy, as well as with a Graduate College of some 5,000 students—all located on the University's single campus in Iowa City. Some faculty members from the University's professional colleges also teach undergraduate classes in the College of Liberal Arts, including participation in an increasing number of interdisciplinary courses. Total enrollment at the U of I during 1977-78 was about 22,000 students.

Founded on February 25, 1847, The University of Iowa is the state's oldest institution of higher education. During its long history, the University has been innovative—and also has earned national, and even international, prominence for many of its programs. For example:

—It established the first law school west of the Mississippi.
—It was the country's first institution of higher education to accept women and men on an equal basis (the year was 1860).
—It became the first university to accept creative work in lieu of the traditional academic thesis from graduate students in the arts.
—The U of I pioneered the now world-recognized Iowa Writers Workshop for creative literature (the Workshop was established as a formal program in the mid-1930s).
—The University also is recognized as the place where the field of speech pathology was originated.

Many other departments in the University's ten colleges also have achieved significant acknowledgement for the quality and creativity of their teaching and research programs in such fields as space physics, expository writing and the teaching of composition, and in graduate programs in speech, dramatic art and communications, to cite just a few recent examples.

The U of I faculty includes some 1,500 full-time members, many of whom have achieved national and international reputations. Their effectiveness as teachers is significantly enhanced by involvement in scholarly and scientific research. The U of I seeks to foster faculty vitality by maintaining a healthy balance between teaching and research, and between undergraduate and graduate-professional instruction.

The University's undergraduate enrollment is about evenly divided between men and women students. Approximately four out of five undergraduates are Iowa residents. The balance consists of students from all other 49 states and more than 70 foreign countries.

About 65 percent of the University's entering freshmen had a "B" average or above in high school. Approximately 86 percent ranked in the upper half of their high school classes and about 27 percent ranked in the upper tenth.

The U of I offers a comprehensive program of student financial aids. Half of the University's students have some form of employment. One-fifth have education loans. One of ten undergraduates and one of five freshmen have scholarships. Most U of I scholarships are awarded on the basis of demonstrated financial need and academic excellence, with a small number of grants awarded solely for scholarly achievement.

Reflecting a growing trend toward lifelong learning, the University in recent years has substantially expanded educational programs both on- and off-campus for individuals who cannot enroll as regular full-time students. These "non-traditional" learning opportunities range from mini-courses, conferences, workshops, and continuing education programs for professionals to Saturday and Evening Classes offered on campus and credit courses taught off campus. In 1977 the U of I, in cooperation with Iowa's other two state universities, introduced a new Bachelor of Liberal Studies (B.L.S.) degree program geared specifically to adults who wish to earn a college degree but are unable to enroll in traditional on-campus study.

Degree Programs

The University offers the following degrees. The major fields are listed in the various college sections of the *Catalog*.

Bachelor of Arts, Bachelor of Science, Bachelor of Music, Bachelor of Fine Arts, Bachelor of General Studies, Bachelor of Liberal Studies, Bachelor of Business Administration, Bachelor of Science in Engineering, Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Industrial Engineering, Bachelor of Science in Mechanical Engineering, Bachelor of Science in Pharmacy, Bachelor of Science in Nursing, Doctor of Dental Surgery, Juris Doctor, Doctor of Medicine, Master of Arts, Master of Science, Master of Business Administration, Master of Fine Arts, Master of Social Work, Master of Arts in Teaching, Education Specialist, Master of Comparative Law, Doctor of Musical Arts, and Doctor of Philosophy.

Accreditation and Associations

The University of Iowa has been accredited by the North Central Association of Colleges and Secondary Schools since the Association's organization in 1913. The University is a member of the Association of American Universities. It is associated with Northwestern, Indiana, Purdue, Ohio State, and Michigan State universities, and the universities of Minnesota, Wisconsin and Michigan in the Western Conference. It is associated with these "Big Ten" universities and The University of Chicago in the Committee for Institutional Cooperation (CIC).

Various colleges and schools of the University are members of accrediting associations in their respective fields, as follows:

Colleges

Business Administration—American Assembly of Collegiate Schools of Business
Dentistry—American Dental Association
Education— National Council for Accreditation of Teacher Education
Engineering—Engineers Council for Professional Development of the American Society for Engineering Education
Law—American Bar Association and Association of American Law Schools
Medicine— Liaison Committee on Medical Education (representing the American Medical Association and the Association of American Medical Colleges)
Nursing—National League for Nursing
Pharmacy—American Council on Pharmaceutical Education

Schools

Journalism—American Council on Education in Journalism
Library Science—American Library Association
Music—National Association of Schools of Music
Social Work—Council on Social Work Education

Departments and Programs

Chemistry—American Chemical Society
Dental Hygiene—American Dental Association Council on Dental Education
Hospital Administration—Accrediting Commission on Education for Health Service Administration
Medical Technology—National Accrediting Agency for Clinical Laboratory Sciences
Physician's Assistant—American Medical Association Council on Medical Education in collaboration with the Joint Review Committee on Educational Programs for the Assistant to the Primary Care Physician
Physical Therapy—American Medical Association Committee on Allied Health Education Accreditation and the American Physical Therapy Association
Nuclear Medical Technology— American Medical Association
Psychology—American Psychological Association
Speech Pathology and Audiology—American Speech and Hearing Association

Sessions

The University's academic year consists of two semesters of approximately 17 weeks each. The University also conducts an eight-week summer session and, following that, an Independent Study Unit of from one to four additional weeks for students in the Graduate College and the College of Law.

Code of Student Life

As members of the academic community, students are encouraged to develop a capacity for critical judgment and to engage in a sustained and independent search for truth. The freedom to learn and the freedom to teach depends upon appropriate opportunities and conditions in the classrooms, on the campus, and in the larger community. Students are expected to respect the general conditions conducive to such freedoms. Accordingly, the University has developed a Code of Student Life that is intended to provide and safeguard the right of every individual student to exercise fully his or her freedom to learn without undue interference by others. This Code applies only to student misconduct which adversely affects some University process or function or some other distinct and clear interest of the University as an academic community. Students are expected to acquaint themselves with the Code and to conduct themselves in accordance with the standards it sets forth.

Human Rights

The University is guided by the precept that in no aspect of its programs shall there be a difference in the treatment of persons because of race, creed, color, national origin, age, sex, or any other classifications that deprive the person of consideration as an individual, and that equal opportunity and access to facilities shall be available to all. This principle is expected to be observed in the admission, housing, and education of students; in policies governing programs of extracurricular life and activities; and in the employment of faculty and staff personnel. The University works cooperatively with the community in furthering this principle.

University Marking System

Mark	Definition	Grade Points/ Semester Hour
A	superior	4
B	above average	3
C	average	2
D	below average but passing	1
F	failing	0
H*	Honors	—
I*	incomplete	—
O*	no grade submitted	—
P*	passing	—
R*	audit	—
S*	satisfactory	—

U*	unsatisfactory (Graduate College only)	—
W*	withdrawn	—

(*not used in computing grade-point averages)

Recognition of High Scholastic Achievement

The University recognizes high scholastic achievement by awarding degrees "with distinction," "with high distinction," and "with highest distinction," based on these criteria:

	Pharmacy	*Other Colleges*
Highest distinction	3.75 + GPA	highest 2%
High distinction	3.50-3.74	next highest 3%
Distinction	3.25-3.49	next highest 5%

Records

All academic records are maintained by the Office of the Registrar and will not be released without written permission of the student.

Honorary and Professional Societies

Phi Beta Kappa, Sigma Xi, Mortar Board, and Omicron Delta Kappa are among 64 national honorary and professional societies in which The University of Iowa has active chapters.

Admission

Correspondence regarding admission to any college of The University of Iowa should be addressed to the Admissions Office, 108 Calvin Hall, The University of Iowa, Iowa City, Iowa 52242. The first letter should request an application for admission, briefly describe the prospective applicant's high school or college background, and outline his or her plans for further study, including the department or general field in which he or she expects to major. All applicants for admission to all colleges of the University must submit formal applications to the Admissions Office and must furnish official transcripts and other supporting material as specified.

Determining Residence

For admission, tuition, and fee purposes, the University Registrar classifies all students enrolling in the University as residents or nonresidents of Iowa, according to criteria established by the Iowa Board of Regents and on the basis of information provided by the student and all other relevant information. The criteria may be found under "Iowa Adminstrative Code: Board of Regents" at the back of the *Catalog*.

Application Deadlines

Applicants for admission must submit the required application documents to the Office of Admissions by the deadline dates listed below. Foreign students usually have earlier application deadlines (see "Foreign Students" below).

College of Liberal Arts

Ten days before Registration begins—all sessions

College of Business Administration

May 1—Summer Session
June 1—Fall Semester
November 15—Spring Semester

College of Dentistry

December 1—Fall Semester only

College of Engineering

Ten days before Registration begins—all sessions

Graduate College

The following are general Graduate College deadlines. Some departments may have earlier deadlines. Early submission of materials is advised. To be considered for graduate awards, the students must apply by February 1 for the fall semester.

May 1—Summer Session
July 15—Fall Semester
December 1—Spring Semester

College of Law

March 1—Summer Semester and Fall Semester

College of Medicine

December 1—Fall Semester only

College of Nursing

March 1—Fall Semester
June 15—Spring Semester
January 15— Summer Session

College of Pharmacy

March 1—Fall Semester only

Dental Hygiene Program

April 1—Fall Semester only

Physical Therapy Program

February 1—Fall Semester only

Physician's Assistant Program

January 15—Fall Semester only

Teacher Education Program

May 15 preceding the academic year in which student plans to enroll in professional education courses

Foreign Students

The University of Iowa encourages foreign students to begin the process of applying for admission at least twelve months prior to matriculation. The applicant should have satisfied all the application procedures and submitted his/her complete application file to the Admissions Office by the dates given:

Graduate College

Those applying to The University of Iowa for financial assistance (scholarships, fellowships, assistantships):

February 1—Summer Session or Fall Semester
October 1—Spring Semester

Students who will not require University financial support:

March 1— Summer Session
April 15—Fall Semester
October 1—Spring Semester

Colleges of Business Administration, Engineering, Liberal Arts:

March 1—Summer Session
April 15—Fall Semester
October 1—Spring Semester

Applications to all other colleges and programs must meet the deadlines set forth above for all students.

American College Tests

The University of Iowa requires all entering freshmen and undergraduate transfer students to complete the American College Tests (ACT) and have their test scores reported to the University before they register for classes.

The University of Iowa uses ACT scores for:

Admission—As a criterion for admitting some students unconditionally or on probation; for requiring some students to attend a probationary summer session; and for denying admission to applicants who do not meet minimal standards.

Placement—As a basis for excusing some students from certain basic course requirements; for placing others in sections designed to meet individual needs; and for advising students concerning their programs of study and future educational plans.

Scholarship—As a criterion for awarding University-administered scholarships and loans.

Scholastic Aptitude Test (SAT) scores may be submitted with freshman or undergraduate transfer admission applications and will be used for admission evaluation. However, ACT scores must be submitted prior to registration.

It is advisable that anyone interested in applying for undergraduate admission at Iowa complete the American College Tests during the fall prior to his or her anticipated registration.

Applicants who have completed the tests but did not have their scores reported to the University should request this reporting from the Records Section, American College Testing Program, Box 451, Iowa City, Iowa 52240. Further information, including testing dates and locations, may be obtained from high school or college counselors, or from the ACT Program.

Graduate and Professional College Examinations

Prospective Graduate College applicants should take the Graduate Record Examination (GRE) Aptitude Test or, if applying for admission to a department of the College of Business Administration other than Economics, the Graduate Management Admission Test (GMAT). Prospective students of the colleges of Dentistry, Law, or Medicine are required to take admission tests of the respective colleges.

Application Fee

A $10 application fee must accompany applications submitted by prospective students not previously enrolled for full-time study at the University during the regular academic year. A Graduate College applicant must pay the fee, unless he or she has earned a degree from The University of Iowa. Application fees are not refundable, except to Iowa residents who are denied admission.

Medical Information

In the interest of providing optimum health care, Student Health Service strongly recommends that following their admission incoming students submit physical examination reports and personal health histories on the forms provided for that purpose. This information does not affect the student's admission and is exclusively for the use of Student Health Service as necessary background for attending to the student's health needs.

Tuition and Fees

The following is the University's schedule of tuition and fees, per semester, for the academic year:

	Undergraduate		Graduate	
hours regis.	res.	nonres.	res.	non res.
0	$72	$72	$85	$85
1	72	72	85	85
2	72	72	85	85
3	104	104	128	128
4	136	136	172	172
5	168	362	220	451
6	200	432	268	550
7	232	502	316	649
8	264	572	364	748
*9	296	642	429	909
10	328	712		
11	360	782		
**12	375	855		

	Medicine		Law		Dentistry	
hours regis.	res.	nonres.	res.	nonres.	res.	nonres.
0-4	$240	$240	$163	$163	$208	$208
5-8	402	904	273	580	352	780
*9	680	1485	429	946	565	1255

*nine hours and over
**twelve hours and over

Extension courses $36 per semester hour. Correspondence courses $22 per semester hour.

General fees provide for the student's use of Iowa Memorial Union facilities, and of libraries, laboratories, and gymnasia; free admission to minor sports events and to student-faculty concerts and plays; reduced rates for admission to major sports events and to performances by visiting stage and concert artists; subscriptions to the student newspaper, the *Daily Iowan*, on a housing unit basis; certain student hospital services; and other activities and services as announced.

Registration

All persons who attend University classes are required to register and pay the established tuition and fees. Students in the Graduate College and the colleges of Engineering, Liberal Arts and Nursing may audit courses with proper approval. Students who audit courses will be assessed fees based on the fewest credits for which the course is available that semester.

Procedure for Payment of Student Accounts

Tuition and fees, board, room and other University residence hall or fraternity-sorority housing expenses, and such incidental University expenses as library and parking fines, are payable on an installment basis, with billing the first of September, October and November for the fall semester, and the first of February, March and April for the spring semester. Students with accounts overdue on the 15th of the month are reported to the Registrar for cancellation of registration. There is a $10 fee for reinstatement.

Refund Schedule

Students who cancel their registration during a regular semester receive reduction of fees assessed as follows: during the first week of classes—90%; during the second week—75%; during the third week—50%. There is

no reduction of fees for cancellations after the third week of classes.

Numbering of Courses

Each course in the regular University curriculum has an identifying number, preceded by the number of the college, department or program by which the course is administered. For example "2:1" is the code for the course numbered 1 in the Department of Botany (2), entitled "Introduction to Botany." Course numbers below 100 designate courses "Primarily for Undergraduates," numbers 100 to 199 designate courses "For Undergraduates and Graduates," and numbers 200 and above designate courses "Primarily for Graduates."

Services for Students

Academic Advisory Offices

Each student is assigned a faculty adviser to assist with registration, educational planning and academic counseling. Students planning to complete preprofessional courses are assigned to academic advisers from the areas of their choice. Students in the professional colleges are advised by the college deans or their designated representatives. Graduate students are advised by their department heads and the Graduate College Dean. In addition to academic advising, advisers also serve as general consultants to students, and refer those with special problems to the appropriate areas.

The Action Studies Program

Patterned after the "free university" concept, the Action Studies Program provides a vehicle for immediate response to student demand for courses too current or too experimental for initiation as part of the regular University curriculum. Anyone with an interest in a particular topic may set up a course with the help of Action Studies. The courses are generally open to anyone who is interested in the course. Courses taken for no credit are free. Regular tuition is charged for credit courses. Most of the courses in the Action Studies Program run concurrently with the regular University schedule. A catalog with course descriptions, times and meeting places is printed every semester.

Admissions

All inquiries, transcripts, evaluations of transfer credit and applications for admission into any college of the University should be directed to the Office of Admissions.

Career Services and Placement Center

Career Planning

Activities include help in developing realistic career plans, locating career alternatives related to major fields of study or interests, learning how to use career information and resources to expand awareness of career options and prepare to enter the work world. Assistance provided through individual career advising, workshops, career days, groups and seminars, and a two-credit course, "Making a Vocational-Educational Choice."

Career Resource Center

The Career Resource Center offers assistance from its professional advising staff, its collection of career pamphlets and tapes, job search aids, education directories, and employer files.

Cooperative Education

Coordinated by the Career Services and Placement Center, the Cooperative Education Program offers students the opportunity to alternate academic studies with related work experiences. Students who meet the prerequisites of their respective colleges or academic departments generally enter the Program following their freshman year. Cooperative education positions are filled on a competitive basis with participating employers making the final selections from among the student candidates.

Placement

Job placement assistance is provided for all seniors and graduate students seeking employment in business, industry, government, and nonprofit agencies. Activities include individual consultations with professional placement advisers, seminars for developing job-hunting/interviewing skills, on-campus interviews with prospective employers, information on employment trends for college graduates, background data on employers, and data on current job opportunities. (Also see "College of Engineering" and "College of Education" for placement services these colleges offer.)

Counseling Service

University Counseling Service offers vocational, educational and personal counseling/

therapy through individual or group sessions. It also offers a number of programs, workshops, and consultation activities. All services are available to students without cost. Faculty and staff are eligible for limited services. University Counseling Service is staffed by psychologists and advanced doctoral students.

Dental Service

The dental clinics at the University of Iowa College of Dentistry are primarily for educational purposes. All employees of the University and all students who are registered in the University may receive dental treatment at the College and will be accorded the same opportunity for treatment as any other patient. However, the College of Dentistry is not affiliated with the University Student Health Service and does not render service under the Student Health hospitalization fund. Fees are established for all treatment rendered, and patients are to pay cash or use their Master Charge cards.

Evaluation and Examination Service

Evaluation and Examination Service duplicates, scores and analyzes many course examinations. It helps faculty members develop and improve their classroom tests by providing thorough analyses of the results of examinations. It also helps faculty or student groups with particular project requests, such as teacher or course evaluation and development. Additionally, it conducts institutional research projects and provides consulting services on questionnaire and survey design.

It administers many of the University's required and optional tests for entering students, and is also a center for many national testing programs, including the American College Test (ACT), Medical College Admission Test (MCAT), Graduate Record Examination (GRE), Graduate Management Admissions Test (GMAT), Graduate School Foreign Language Test (GSFLT), Law School Admission Test (LSAT), Test of English as a Foreign Language (TOEFL), Miller Analogies Test (MAT), and College-Level Examination Program (CLEP).

Health Service

The Student Health Service is located in the Children's Hospital in the University medical complex. All registered students at the University are eligible for outpatient care at the Student Health Clinic. There are charges for laboratory procedures, X rays and some special procedures. All students are advised to have health and accident insurance. If such coverage is not available under an existing family or group plan policy, a University-sponsored group insurance is available for individual students or as a family plan.

High School-College Relations

Administered as a part of the Office of Admissions, the High School-College Relations Office coordinates and implements all scheduled relations with secondary schools and institutions of higher education.

Intercollegiate Athletics for Men

The University is a member of the Western Intercollegiate Conference (Big Ten), and has athletic programs in football, basketball, track, baseball, swimming, golf, wrestling, tennis, cross-country and gymnastics. Operating policies are determined by the Board in Control of Athletics, which is composed of 12 members from the University's teaching and administrative staff, two University alumni, one representative of the University Staff Council and two students.

Intercollegiate Athletics for Women

Women's intercollegiate athletics at The University of Iowa include basketball, cross-country, field hockey, golf, gymnastics, softball, swimming, tennis, track and field, and volleyball. Athletic scholarships are available to qualified female athletes in all sports.

The University is a state, regional and national member of the Association for Intercollegiate Athletics for Women (AIAW), and fully supports its athletes in state, regional and national AIAW competitions. Regularly scheduled competition includes other Big Ten universities.

Through the Women's Intercollegiate Sports Committee, each student athlete has a voice in the determination of Women's Athletic Department policies. The voting membership of the committee comprises a team representative in each sport, the coach in each sport, a student-elected president, and the women's athletic director.

(Office of) International Education and Services (OIES)

The OIES assists American students who wish to study, travel, or work abroad, and counsels foreign students who attend the University.

The Foreign Student Advisers in the OIES promote and facilitate interaction between American and foreign students and professionals. They also provide information, advice and counseling for the over 800 foreign students and professionals in such areas as immigration, personal and social adjustment, and financial planning.

The OIES operates the International Center, which students, faculty and Iowa City community members use for meetings, meals and activities which have an international focus.

Intramural Sports and Recreational Activities

Through the University's Division of Recreational Services, all interested students have opportunities to participate in more than 20 different intramural sports and recreational activities. (See "Recreational Services" in "General Services and Facilities.")

(Office of) Overseas Study and Travel Abroad

The Office of Overseas Study and Travel Abroad serves University of Iowa students who wish to study, work, or travel abroad. Its extensive reference collection provides information on study abroad programs offered by the University and by foreign or domestic institutions of higher learning, as well as material on foreign university libraries and special collections, volunteer work, student flights and land travel,

hosteling, overseas accommodations, etc. The Office gives students individual counseling on study abroad programs which will complement their on-campus academic programs; assists them in obtaining correct credit assignment for foreign study; and provides current information on overseas conditions, health regulations, customs and duties, and all aspects of foreign travel. The International Student Identity Card may be obtained in this office.

Iowa Memorial Union

The Union is the center of University cocurricular activities. It houses the Student Activities Center, University Counseling Service, Career Services and Placement Center and Campus Information Center. Its facilities include a variety of food services, a bowling and billiards area, a barber shop, a creative crafts center, a bookstore, a sundries shop, a television room, lounges, meeting rooms, auditoria for lectures and concerts, art and sculpture display areas, and, in the adjoining Iowa House, 109 guest rooms for parents, alumni, conference and workshop participants, and other visitors to the campus.

Orientation Office

With the aid of representative student, faculty and staff personnel, the Orientation Office designs and conducts a wide variety of programs to help new students—freshmen, transfer and graduate—with as many of their how-to and where-to questions as possible, in the academic area, regarding services and facilities available to them, and in all other aspects of student life in the University community.

Reading Lab

The Reading Lab of the Rhetoric Program provides a variety of individualized and class instruction for any University students who wish to improve their college-level reading performances. Students are asked to specify what reading problems they have met; teachers adapt practical materials and methods to help tackle those problems. Students may work on improving study skills, including locational skills, test-taking abilities, command of vocabulary, comprehension, critical reading and increased rate of reading.

The Reading Lab offers one service course, Voluntary Reading Lab, which meets twice a week for 12 weeks. Students may attend more or less often if they wish, and may enroll at any point during that time if they feel they need reading help. The Lab carries no credit and assigns no grade. Ordinarily, no outside assignments are given. Developmental reading work is restricted to Lab hours, and makes extensive use of Lab materials and the students' own texts in other courses.

The Lab also offers five for-credit courses: 10:8 Rhetoric, for students who need exceptional help preparing for college-level reading; 8P:20 Advanced Reading Comprehension, 8P:30 Speeded Reading, and 8P:40 Practical College Vocabulary, independent five-week module courses for one semester hour of credit each; and 8P:370 Teaching in a Reading Laboratory.

Registrar

The Office of the Registrar determines the residence status of each student, issues University identification cards, supervises registration procedures, assesses fees, and maintains all students' academic records and official transcripts; assists students in determining graduation requirements, processing applications for degrees, and interpreting college and University academic regulations; provides assistance to students concerning Selective Service and military service matters; and helps student veterans with University application and enrollment procedures, and receipt of Veteran Administration benefits.

Special Support Services

The Department of Special Support Services (SSS) was established to make it possible for more students from economically and educationally disadvantaged or culturally different backgrounds to receive a higher education at The University of Iowa. Special Support Services provides academic, financial, and personal assistance programs.

Special Support Services is made up of the following subprograms: The Upward Bound Project; the Undergraduate Educational Opportunities Program; New Dimensions in Learning; The Educational Opportunities Professional and Graduate Programs; the Afro-American Cultural Center; and the Chicano-Native American Cultural Center.

Speech and Hearing Clinic

The University of Iowa Speech and Hearing Clinic provides services for speech, language, and hearing problems. Any University student may receive needed services without charge. Services include diagnostic examinations, consultations, individual clinic sessions, small group sessions and referrals to other clinics as needed.

(Division of) Sponsored Programs

The Division of Sponsored Programs maintains a Resource Center, which contains information on federal and nonfederal sources of funding for study and research projects by faculty and graduate students. Graduate students may inquire about funds for advanced study, either in the United States or abroad. The Division also publishes a weekly newsletter, *Research and Graduate News*, which contains program and deadline information and carries a special section devoted to graduate fellowships. These newsletters are available at departmental offices; further inquiries about these opportunities are welcome at the Resource Center. In some instances, the Center provides direct assistance with application for graduate fellowships, as is the case with graduate fellowships authorized under the Fulbright-Hays Act, with the Tuebingen Exchange Scholarship, and with dissertation support applications to federal agencies in the United States.

Student Activities

Members of the Student Activities staff work with students who are interested in forming new organizations, becoming active in existing organizations, or improving the quality of organizations. Student Activities offers consultative assistance in programming, planning, budgeting, membership recruitment, decision making, goal setting, and other aspects of organizational administration. Through the College of Education's Division of Counselor Education, Student Activities offers a three-credit course, 7C:187 Management and Motivation in Organizations and Activities, for leaders and members of student organizations. Student Activities designs mini-courses to

meet student organizations' needs at their request. The Student Activities Center in the Iowa Memorial Union provides typewriters, duplicators and mimeograph machines, a photocopier, free telephones, and office supply purchasing services for use by recognized student organizations. The Student Activities Resource Center contains readings related to personal growth and organizational development.

Transcripts

Students who have completed work at The University of Iowa may obtain an official transcript of that work upon request to the Office of the Registrar. Fees are $2 for the first copy, $1 each for the second through fifth, 50 cents each beyond the fifth. An official transcript cannot be issued for a student who has a past-due University account.

Veterans' Services

Veterans, dependents of veterans, and servicemen are served as a part of the Office of the Registrar. The Veterans Services Office provides assistance, information and tutorial programs for veteran students. People with questions or problems related to Veterans Administration benefits or registration and study at the University should contact this office.

Women's Resource and Action Center

The Women's Resource and Action Center (WRAC) provides services to meet the academic, vocational, and personal needs of women. Its staff acts as a resource for many women's organizations; sponsors numerous cultural programs, lectures, support groups, and consciousness-raising groups; sponsors a Brown Bag Luncheon program featuring women speakers from the community and the University; and publishes a monthly *WRAC Newsletter*. The WRAC houses the Sojourner Truth Women's Resource Library, and maintains a three-volume reference catalog. The WRAC's Rape Victim Advocacy program provides a 24-hour telephone service for emergency advice and counseling, is active in preventive education, and maintains information and speaker bureaus.

Writing Lab

The Lab offers individual instruction in writing to any University student. Each participating student's own writing is the content of the course for that person. The teacher responds to what each person writes, and, in personal conferences, helps him or her identify and overcome particular writing problems.

Any student who believes he or she cannot do the writing expected in the required Rhetoric course may confer with the director of the Lab about taking individual instruction in writing for credit (10:9 Rhetoric), before registering for the required course. Non-credit students may enroll throughout the semester.

Housing

Unmarried students with less than 56 semester hours of college credit are required, as a condition of University registration, to live in University residence halls, excepting students who normally would have completed three years at the college level, or who qualify for specific exemptions. Exemption criteria are outlined in the parietal rule brochure available from the University Housing Assignment Office, Burge Hall, The University of Iowa, Iowa City, Iowa 52242. Exemption requests must be received by the University Housing Assignment Office at least 30 days before the session for which the exemption is requested. Exemption request forms are available from the University Housing Assignment Office.

Fair Housing Policy

The following is the University's statement on fair housing practices:

"It is and shall be the firm policy of the University that householders shall rent to all students on the basis of their individual merits as persons, without exclusion or discrimination on the basis of race, creed, color or national origin."

Iowa City has a fair-housing ordinance providing for equal opportunity to secure housing without distinction due to race, religion or ancestry, except in certain instances involving owner-operator dwelling units. A Human Relations Commission is responsible for the observance of this ordinance and for the initiation of redress for violations of it.

University Residence Halls

University residence hall furnishings, facilities and services are designed to provide a pleasant atmosphere conducive to effective study.

Single, double, triple and quadruple rooms with full or partial board are available in the Grand Avenue Residence Halls (west campus), which include Hillcrest, Quadrangle, Westlawn, South Quadrangle, Rienow and Slater halls, and in the Clinton Street Residence Halls (east campus), which include Burge Hall, Currier Hall, Daum House and Stanley Hall. There are lounges, study rooms, browsing libraries and recreation rooms in or available to each residence hall.

Each residence hall is divided into small living units. Each hall has a full-time head resident, and there is a student resident assistant in each living unit. All students are encouraged to participate in residence hall government at the unit, building, area, or system level.

Student and staff initiated programs and activities provide opportunities to pursue social, recreational, cultural, and educational interests. Academic counseling is also available in residence halls.

Students not living in residence halls may contract for full or partial board.

Juniors, seniors and graduate students may request residence hall accommodations in areas reserved for them.

Applications and Assignments

Prospective undergraduate students receive with their application for admission a separate application for residence hall accommodations. Prospective students applying for residence hall accommodations should read the terms and conditions of the contract, complete all information requested on the application form, sign the contract portion, complete the advance payment form and return the completed application with their check in the amount of $50 to the University Housing Assignment Office.

Applications for residence hall housing are not considered until the applicant has been admitted to the University.

Students are encouraged to choose their own roommates. Prospective roommates must request assignment together when they apply, preferably with both applications submitted at the same time. The assignment of roommates will not be made until all of the prospective roommates' application materials have been received and both have been admitted to the University. The application last received or the student last admitted determines the date order of

assignment. Roommate assignment is made without regard to race, color, nationality or religion.

Students already living in University residence halls are given priority in the assignment of accomodations.

The residence hall application and $50 advance payment constitute a contract offer. An application may be withdrawn by notifying the University Housing Assignment Office in writing before the application becomes a binding contract. It becomes binding after June 1, if for the academic year; after December 1, if for the second semester only; after May 15, if for the summer session; or ten days after the University Housing Assignment Office issues notice of the acceptance of the contract and assignment of accommodations. If the notice is made within nine days before the beginning of registration, the contract becomes binding two days before the beginning of registration.

Upon written request, the $50 advance payment will be refunded to applicants who are not admitted to the University, and to those who cancel their residence hall contracts in accordance with the terms and conditions set forth in the contract.

Rates

Basic rates for University residence hall accommodations for the (1978-79) academic year are $1,438 for a double room and $1,308 for a triple, with full board. Rates for the several available room and board options vary according to the accommodations, and *all rates are subject to change annually*.

Married Student Housing

There are 799 University-operated apartments available to married students in the Hawkeye Drive, Hawkeye Court, Hawkeye Park, and Parklawn complexes.

Rents for 1978-79 ranged from $103 to $111 per month for one-bedroom units (there are only 41 available at the lower rate) to $137.50 for two-bedroom units, not including gas, electricity and telephone. All units are unfurnished. *Rates are subject to change annually*.

Married student housing is assigned in the order applications are received. Assignments are contingent on the applicant's meeting all University admission requirements. Applications may be filed before completion of admission, but will not be accepted more than a year in advance.

A $25 advance payment is required for all apartments at the time they are offered for leasing.

Off-Campus Housing

The Housing Clearinghouse, located at the Campus Information Center in the Iowa Memorial Union, maintains and provides accurate up-to-date listings of available rental units in the Iowa City area—large apartment complexes, smaller complexes, rooms in private homes, and one, two, and three-bedroom duplexes and houses. The Clearinghouse also suggests other resources to use in looking for housing, and offers a packet of helpful information for prospective residents of the area.

Fraternities

Nineteen undergraduate and six professional fraternities operate chapter houses at Iowa. Houses accommodate 35 to 45 men.

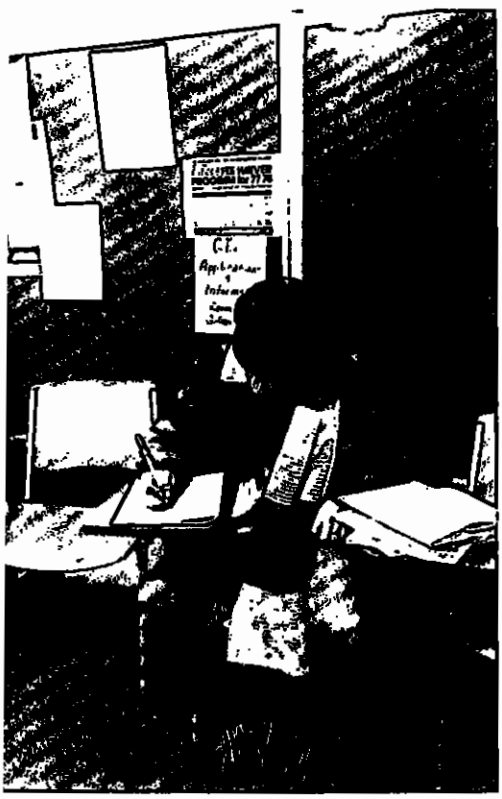
Undergraduate fraternities are Acacia, Alpha Epsilon Pi, Beta Theta Pi, Delta Chi, Delta Tau Delta, Delta Upsilon, Kappa Sigma, Lambda Chi Alpha, Phi Delta Theta, Phi Gamma Delta, Phi Kappa Psi, Phi Kappa Sigma, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Pi and Tau Kappa Epsilon.

Professional fraternities operating chapter houses include Alpha Chi Sigma (chemistry), Alpha Kappa Kappa (medicine), Delta Sigma Delta (dentistry), Phi Beta Pi (medicine), Phi Rho Sigma (medicine) and Psi Omega (dentistry).

Sororities

The 14 national sororities active at Iowa are Alpha Chi Omega, Alpha Delta Pi, Alpha Phi, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Gamma, Delta Zeta, Gamma Phi Beta, Kappa Alpha Theta, Kappa Kappa Gamma, Pi Beta Phi and Zeta Tau Alpha.

Financial Aid



All financial assistance available to University of Iowa students from general University sources is administered by the Office of Student Financial Aid. Assistance is provided through scholarships, grants, loans, and part-time job placement. A student seeking assistance must first complete University admission procedures, including the American College Test, and submit a parents' financial statement through College Scholarship Service, Box 380, Berkeley, California 94701, or ACT Financial Aid Services, Box 1000, Iowa City, Iowa 52240. When a copy of the parents' statement is received, the Office of Student Financial Aid will supply forms and instructions for applying for aid at Iowa. Only one application is necessary each year for all forms of assistance administered by the Office of Student Financial Aid. Application deadline is February 1.

Eligibility for Scholarships

To qualify for scholarship assistance, an entering freshman must have graduated in the upper 10 percent of his or her high school class or have achieved a 28 or above composite ACT score. Upperclassmen and transfer students must have a 3.00 cumulative grade-point average for the initial scholarship award, and must maintain at least a 2.75 to continue the scholarship.

Freshman/Transfer Merit Award

Entering students may receive this recognition for having met specific academic criteria. These scholarships are available to entering freshmen eligible for the University of Iowa Honors Program (28 or greater ACT composite and ranking in the upper quarter of their high school graduating class), to freshmen graduating in the upper one percent of their high school class, and to transfers with a 3.25 transfer GPA. The award is $100. No special application is required, as eligibility is determined from the admission application.

Basic Educational Opportunity Grants

The maximum BEOG is $1600 minus the amount of computed family contribution. Application is made through either the CSS or ACT financial statement or by obtaining a Basic Grant application form from any high school counselor's, college financial aid, or public office.

Supplemental Educational Opportunity Grant

Available to a limited number of undergraduate students unable to attend college or university without such assistance, SEOG grants range from $200 to $1500 a year but cannot exceed one-half of the recipient's total assistance. There are no specific academic requirements for an SEOG grant, but the applicant must show academic or creative promise.

National Direct Loan Fund

This is the University's largest source for long-term educational loans. Undergraduate students may borrow up to $1,000 per year and $5,000 overall; graduate students may borrow up to $2,500 a year and $10,000 overall. Applicants must be citizens or permanent residents of the United States. An upperclassman must be in good academic standing and be making normal progress toward a degree. The applicant cannot be in default or delinquent on a previous loan. No interest is charged while the borrower is at least a half-time student. Loans are repayable at three percent interest beginning nine months after the borrower concludes his course of study.

Health Professions Scholarship and Loan Program

Students are eligible to apply for a Health Professions Scholarship and/or Loan at a school which participates in the program, if the student is a citizen or national of the

U.S.; is enrolled or accepted for enrollment as a full-time student pursuing a course of study leading to degrees of doctor of medicine, dentistry, osteopathy, optometry, podiatry, veterinary medicine, or a degree in pharmacy and/or nursing; and is in need of such financial assistance to pursue the course of study. In addition, health professions students must be full-time students and nursing students must be registered at least half-time. Repayment of the loan portion is arranged with the school at the time of graduation or at the time the student ceases to be a full-time student.

Law Enforcement Education Program

This program consists of federally-funded loans and grants. Loans can be up to $2,200 per year, and grants can be for a maximum of $400 per semester to be used for actual costs of tuition and books. To be eligible for the loan program, a participating school must have more than 15 hours of courses directly related to law enforcement. All participating schools are eligible for grants. The program is available to pre-service and in-service law enforcement personnel, although grants are limited to in-service personnel. A recipient can be either a full- or part-time student. Cancellation provisions are available with the loan program.

Guaranteed Loans

Undergraduates may borrow a maximum of $2,500 and graduates $5,000 per year. Money may be borrowed through commercial banks, credit unions, savings and loan associations and other eligible lending institutions. Repayment begins when the student ceases to be at least a half-time student.

University Loan Funds

Short-term loans of up to $500 are available for school-year expenses. To qualify, the applicant must have at least a 2.0 high school and transfer grade-point average, and a 1.8 University average.

Part-Time Jobs

Most University students who take part-time jobs secure them through the Office of Student Financial Aid. The most numerous opportunities are in University Food Service and Hospitals. Hours range from 10 to 20 a week; for a beginning student, the University recommends no more than 12 hours per week.

Work-Study

Part-time work available through the Office of Student Financial Aid is provided under the federal College Work-Study Program, the purpose of which is to expand job opportunities for those who must earn a part of their educational expenses not covered by other assistance. Work-Study employees may work an average of 20 hours a week throughout each academic session. As far as possible, Work-Study jobs are arranged to give employees work experience related to their educational goals.

Scholarships, Fellowships, Assistantships

A separate publication listing scholarships, loans, awards and prizes available to students in the several colleges of the University is available upon request from the Office of Admissions, 107 Calvin Hall.

The University of Iowa Health Center

The University of Iowa has a major role in the preparation of health professionals for Iowa and the nation. In its Health Center are found the academic programs, clinical facilities and service agencies involved in preparing students and practitioners to serve a wide spectrum of human health needs, ranging from basic first aid to the most advanced diagnostic and treatment procedures, and on to the search for entirely new knowledge, through research.

As soon as they have acquired basic knowledge in their fields, health profession students begin to learn by doing, by following the examples and directions set forth by the skilled practitioners who teach as they diagnose, treat, prescribe, operate and otherwise care for patients. Thousands of individuals from the community, state and region receive direct health services through these processes. Thus the University of Iowa Health Center is simultaneously a center of learning and of service. It is one of the most advanced, comprehensive health science centers in the United States.

Many Health Center skills are shared off campus through cooperative programs with other Iowa colleges and community colleges, and through a variety of continuing education programs for health practitioners—many of whom also return to the Iowa campus to update their skills through conferences, clinics and "refreshers" conducted by the University of Iowa health science educators.

Programs, faculties and courses of the colleges of Dentistry, Medicine, Nursing and Pharmacy are cited elsewhere in this *Catalog*. Other Health Center units and related programs are described below.

University Hospitals and Clinics

Director and assistant to the president for health services: John W. Colloton
Associate director: Stephen L. Ummel
Special assistant to the director: Douglas R. Wilkamson
Assistant directors: John H. Staley, Fred N. Lineer
Assistant director for planning: Gary L. Fletcher
Assistant to the director for legal services: Robert D. Miller
Clinical service heads: *anesthesia*, Dr. Wendell C. Stevens; *dentistry*, Dr. Merle L. Hale; *dermatology*, Dr. John S. Strauss; *family practice*, Dr. Robert E. Rakel, *internal medicine*, Dr. Francis Abboud; *neurology*, Dr. Maurice W. Van Allen; *obstetrics and gynecology*, Dr. Roy M. Pitkin; *ophthalmology*, Dr. F. C. Blodi, *orthopaedics*, Dr. Reginald Cooper; *otolaryngology and maxillofacial surgery*, Dr. Brian McCabe; *pathology*, Dr. George D. Penick; *pediatrics*, Dr. Fred Smith; *psychiatry*, Dr. George Winokur; *radiology* Dr. James H. Christie; *surgery*, Dr. Sidney E. Ziffren, *urology*, Dr. David A. Culp

The University of Iowa Hospitals and Clinics is the nation's largest university-owned teaching hospital, and is dedicated to the concept of health science education through delivery of highly sophisticated, tertiary-level care to patients referred to the hospitals by physicians and dentists from throughout Iowa and the region. The institution is the hub of Iowa's health care delivery system in its role as a tertiary care center providing advanced diagnostic and therapeutic services.

University of Iowa Hospitals and Clinics is the clinical base of graduate and undergraduate studies for thousands of students in the health disciplines, including medicine, dentistry, nursing, pharmacy, hospital administration, physical therapy, vocational training, pastoral studies and social work.

University Hospitals and Clinics sponsors residency programs in which more than 400 physicians, dentists and pharmacists gain advanced clinical knowledge and skills in the health care specialties they have chosen to pursue. More than 80 other physicians in training at University Hospitals and Clinics are fellows—experienced clinicians who have advanced to subspecialty practice and research.

An integral part of The University of Iowa, University Hospitals and Clinics is governed by the Iowa State Board of Regents. Through the president of The University of Iowa, the Regents delegate the responsibility for the operation of the Hospitals to the director of University Hospitals, who also serves as assistant to the president for health services of the University.

The Hospitals' operational policies are established by the Hospital Advisory Committee, a group comprising the chiefs of

the hospitals' clinical services, the hospital director, the dean and an associate dean of the College of Medicine, and two at-large clinical faculty members. The hospital is organized into 16 clinical services, 18 administrative departments, and 47 subspecialty clinics.

Each of the clinical services of University Hospitals is directed by a chief of service who heads the corresponding academic department in the College of Medicine or the College of Dentistry. Each of these clinical areas has its own inpatient and outpatient services and, where applicable, special diagnostic and treatment units. The Hospital and its clinical programs are fully accredited.

Hospital services and facilities have evolved since the establishment of the University's first medical school in 1870. In 1898, the State of Iowa opened its own University Hospital, a facility which by 1914 had grown to 240 beds.

Progressive legislation passed by the Iowa General Assembly between 1915 and 1925 recognized the state's responsibility for providing high-quality health care for its citizens and provided impetus for the construction of an 800-bed general hospital that has grown into the present University Hospitals and Clinics.

A study conducted in conjunction with the Hospitals' 75th anniversary in 1973 showed that University Hospitals and Clinics had provided health care services to nearly 1,000,000 individuals since the existing facility was opened in 1928. Eighty percent of those patients were members of 517,000 different Iowa families—*more than half of all Iowa families in existence during those years*.

Programs and staffs of Hospital School, Oakdale Hospital and Psychiatric Hospital are integrated for administration within the University Hospitals, and the units function as a single system. Today there are 1,181 beds within the Hospital complex, accommodating some 40,000 admissions annually. In addition, 51 specialty clinics accommodate another 300,000 ambulatory patients each year. Nearly 15,000 major surgical procedures are performed annually in the Hospitals' 20 major operating rooms. Approximately 2,800 infants are delivered every year.

Highly specialized health services—e.g., the burn unit, heart catheterization facilities, neonatal intensive care unit—are easily accessible to Iowans who reside in communities without such resources. To facilitate use of these and other specialized services, the Hospitals operate a unique patient transportation service, with a fleet of 15 vehicles which travel nearly two million passenger-miles each year transporting 9,500 Iowans to and from University Hospitals and Clinics.

More than 4,000 Hospital staff members are involved each day in providing professional and support services needed to care for approximately 2,200 patients. The Hospitals' clinical staff is comprised of more than 315 faculty physicians and dentists assigned among the 16 clinical services. The House Staff of University Hospitals numbers over 470 resident physicians and dentists. The Hospitals' Department of Nursing is staffed by 1,000 persons, more than half of whom are professional nurses.

Other Hospital staff members annually provide over 179,000 X-ray examinations and treatments, conduct over two million laboratory tests, fill more than one million prescription orders, render more than 26,000 physical therapy treatments and prepare nearly 37,000 blood and component transfusions.

New intensive care, cardiology and urology units have resulted from recent modernization efforts. A seven-story, $15 million North Tower Addition went into service in 1976, providing expanded and replacement facilities for a variety of inpatient and outpatient services. The new $20 million Roy J. Carver Pavilion, named in honor of a $2 million gift from the Muscatine industrialist, provides replacement facilities for a multi-specialty trauma and emergency treatment center, physical therapy department, orthopaedic inpatient, clinic and faculty offices, and 148 beds to replace outmoded facilities in Children's Hospital and Oakdale Hospital.

University Hospitals and Clinics also collaborates in conducting eight accredited health professional education programs: a nine-month Dietetic Internship Program; two-year Radiologic Technology, Medical Technology and Nuclear Medicine Technology programs; a two-year Physician's Assistant Program; a two-year Hospital Pharmacy Residency Program; a two-year Physical Therapy Program; and (in conjunction with Mercy Hospital in Des Moines) a three-year Cytotechnology Trainee Program.

The University Hospitals and Clinics also provides a clinical setting where students in four health education programs offered by Kirkwood Community College in Cedar Rapids are provided supervised opportunities to apply and integrate knowledge, attitudes and skills learned in the classroom. These programs are one- and two-year courses in Nursing Education; a two-year Orthopaedic Physician's Assistant Program; a one-year Operating Room Technician Program; and a two-year Respiratory Therapy Program.

The Bureau of Dental Health Education

The Bureau of Dental Health Education is sponsored jointly by the Iowa State Department of Health, which provides personnel, salaries and office supplies, and the University, which provides space and equipment.

The Bureau's primary purpose is to promote a program of dental health education and disease prevention in the public and parochial schools of the state. Senior dental hygiene students from the University conduct "Team" programs with the Public Health Dental Hygienists of the Iowa State Department of Health. These programs include instruction in oral hygiene, good dental health practices, and nutrition as related to dental health. A weekly fluoride rinse is initiated as a decay preventive which is continued for the remainder of the year. Dental referral cards are also made available to schools to remind parents of the need for regular dental care for children.

Council on Speech Pathology and Audiology

The council coordinates clinical services in speech pathology and audiology offered in The University of Iowa and the Veterans Administration Hospital.

Health Occupations Education

Through this program, the University collaborates with the State Department of Public Instruction in providing consulting and advisory services, educating teachers, conducting research and developing cur-

ricula and instructional material for health occupations programs conducted for the most part by Iowa's 15 area community colleges, but also including a growing number of high schools. The Health Occupations Education staff also assists these institutions in staffing and conducting continuing education efforts, enrolling nearly 69,500 registrants in more than 3,400 courses each year.

Health Sciences Library

The Health Sciences Library serves the combined information and research needs of the colleges of Dentistry, Medicine, Nursing, and Pharmacy, and the Department of Speech Pathology and Audiology. The largest of the departmentals in the university library system, the Health Sciences Library contains over 150,000 volumes and receives more than 2,700 periodicals. In addition to providing ample space for these collections, the interior allows for enough reading and study space to accommodate approximately 1,100 people. Special features of the Library range from computerized access to the latest health sciences literature via MEDLINE and other data bases to the rare books (some dating back to the 15th century) in the John Martin Rare Book Room.

Health Services Research Center

Organized to foster research, education and demonstration projects relevant to the health needs of non-metropolitan areas, the Center consists of a multidisciplinary core of scholars drawn from the Colleges of Medicine, Dentistry, Nursing, Pharmacy, Education, Engineering, Business Administration, several social science departments in the College of Liberal Arts, University Hospitals and Clinics, and the Veterans Administration Hospital. These individuals have a mutual interest in improving the health services delivery system in Iowa, the Midwest, and the nation as a whole.

Iowa Mental Health Authority

Authorized by Congress under Public Law 79-487 in 1946, the Iowa Mental Health Authority is a state agency affiliated with the University of Iowa College of Medicine and located at the University of Iowa Oakdale Campus. The primary function of the Authority is to provide state-level support for Iowa's 32 community mental health centers, which are private nonprofit corporations. The Authority provides consultation, staff development, assistance in information management, standards development and evaluation, and research in support of services for these centers. The Authority consults with communities about developing local services; performs liaison and planning activities with other local, state and federal programs in the mental health delivery system; and provides consultation on federal mental health construction and staffing grants through the National Institute of Mental Health.

Oakdale Campus

Located seven miles northwest of the Health Center, the 525-acre Oakdale campus includes an alcoholism treatment unit, physiology and pediatrics research laboratories, the Institute of Agricultural Medicine, research animal-care facilities, a Model Office for Family Practice, a Model Rural Health Center and University House, which provides facilities and support for faculty research and curriculum development. Among the several policy research components of University House are the Health Services Research Center, Gerontology Center, and the Institute of Child Behavior and Development.

Psychiatric Hospital

Part of the University Hospitals system, Psychiatric Hospital contains clinical and research laboratories in neurophysiology, biochemistry and psychology. The electroencephalographic laboratories serve the entire University of Iowa Health Center.

State Hygienic Laboratory

Laboratory staff members perform a variety of diagnostic, surveillance, training and consulting functions in such areas as bacteriology, parasitology, industrial hygiene, serology, virology, health physics, radiation chemistry, water and air pollution, drinking water analysis, pesticides and herbicides, toxicology, mineral analysis and disease surveillance. The laboratory provides virological and serological diagnostic services for University Hospitals and Clinics and for the U of I Student Health Service.

State Services for Crippled Children

Crippled children's services are supported by federal appropriations through the United States Department of Health, Education and Welfare and by state appropriations through the University Hospitals. State Services for Crippled Children (SSCC) provides a state-wide program of services for Iowa persons under the age of 21 with special health problems and multiple handicaps.

Diagnostic and evaluation services are offered at child health clinics conducted annually in communities throughout the state and at clinics of the University of Iowa Hospitals. Medical examiners at the clinics are staff members in the departments of Pediatrics, Orthopaedic Surgery and Otolaryngology. Diagnostic services are also provided in the areas of speech pathology, audiology, clinical psychology, dentistry, and ophthalmology.

Patient service staff members assist the children's families in making arrangements to obtain the care and treatment recommended at clinics and monitor their implementation. At the local level, SSCC maintains regional liaison offices and participates in the development of community child health centers.

The agency conducts research on special health problems related to handicaps, such as muscular dystrophy, mental retardation, phenylketonuria, and high-risk conditions of the newborn.

SSCC subsidizes a University of Iowa graduate training program in audiology and speech pathology and its clinics are sites for the Department of Pediatrics.

University Hospital School

A University Affiliated Program dealing with the problems of developmentally disabled children and young adults, the Hospital School serves as the focus of activity for the Division of Developmental Disabilities within the Department of Pediatrics. It is an integral part of the tertiary-level health services available through University Hospitals and Clinics.

The interdisciplinary team approach provides services involving the fields of medicine, dentistry, nursing, nutrition, speech and audiology, physical and occupational therapy, activity and music therapy, psychology, social work, special

education, physical education, pre-vocational and vocational activities.

Through general and specific diagnostic clinics, individuals are evaluated, and programs of education and therapy are planned in conjunction with the parents, the Area Education Agency, and the local school district.

The residential program provides a variety of educational and therapeutic services for children who are judged to require services not available in the local community. The goal of the program is to return the children as quickly as possible to their home communities and schools.

The day program provides special education, therapy and functional training for selected children and young adults who are mentally retarded and who reside in the Iowa City area.

Training activities include pre- and in-service lectures, workshops, practicums and seminars for a variety of care providers working in other facilities or community programs. These activities take place in the University and community setting.

Close cooperation exists with the state Developmental Disabilities Council and other state agencies in providing training and technical assistance to their programs.

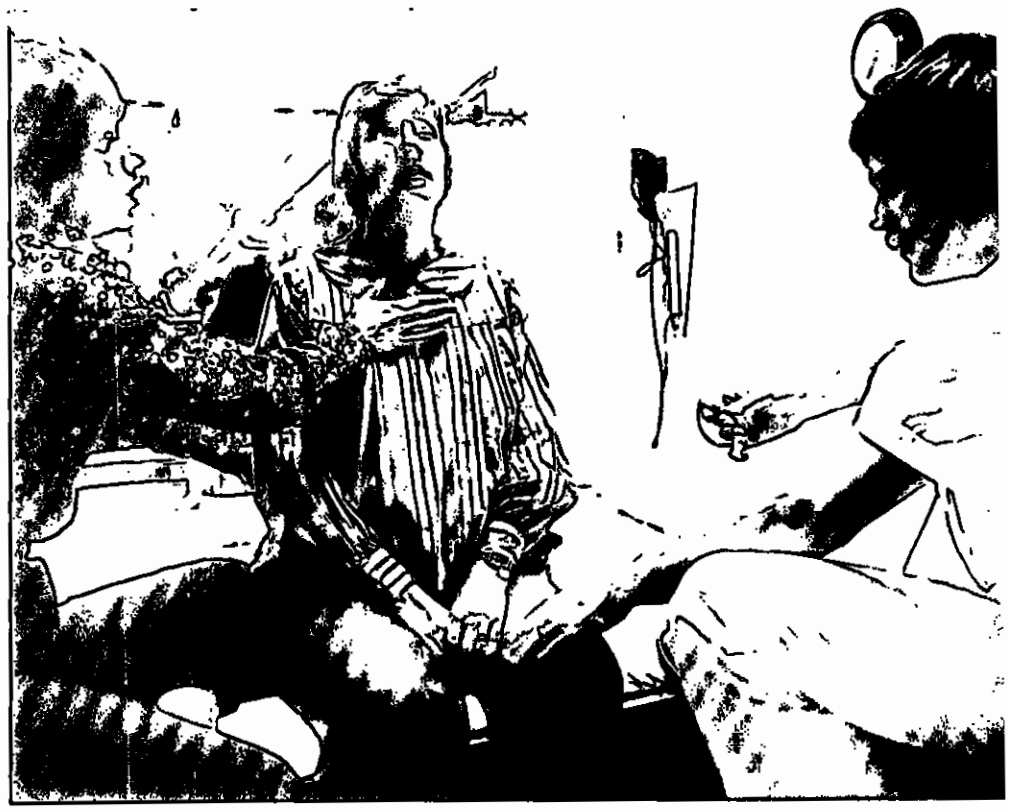
The Child Development Clinic, serving the learning-disabled child, the socially disruptive child and family, and the child with selected metabolic disorders, is an active component of the Division.

The laboratories of the Divisions of Genetics and Biochemistry are also housed in the University Hospital School and are utilized extensively in its research, training and service programs.

University Speech and Hearing Clinic

Located in the Wendell Johnson Speech and Hearing Center, the Speech and Hearing Clinic provides training for students of the Department of Speech Pathology and Audiology. In addition to audiologists and speech pathologists, the staff includes a psychologist, and evaluations and consultations by physicians and other health care professionals can be arranged when appropriate.

The Clinic provides out-clinic evaluation and consultation services for individuals with speech, language and/or hearing problems; day-clinic habilitation or rehabilitation service programs for persons who can come to the Clinic for such service; and a Summer Residential Program for children with



speech, language, hearing and/or reading problems.

The Veterans Administration Hospital

Medical students and residents receive much of their clinical training at this 360-bed hospital, in which are based several of the major facilities of the U of I Health Center. These include laboratories for the transplantation program, highly specialized laboratories in nuclear medicine, and special units for the study of metabolic and gastrointestinal diseases. The VA Hospital also offers unique training opportunities in the fields of clinical pharmacology, gastroenterology, cardiology, nephrology and applied immunology.

Research Activities

The University recognizes that creative activity is an indispensable function if its teaching is to have the relevance, freshness and effectiveness expected of a distinguished institution of higher learning.

The University holds that the term "research" applies to creativity in all fields. Imaginative originality, whether in the fine arts or in the sciences, is of a common character and significance in the overall intellectual life of the institution.

The Office of the Vice-President for Educational Development and Research maintains an overview of the many individual research commitments of the institution and actively promotes, in a variety of ways, the research mission of the University and the educational development efforts of the faculty. This office has an interlocking relationship with the Graduate College, because of the all-University character of the College and the close connection between the graduate programs and research and creative activity.

The University Research Council assists the Vice-President for Educational Development and Research in a regular advisory capacity. The Council consists of ten faculty members with widely recognized personal involvements in basic research or creative activity, one representative of the University staff, and two student members. Faculty members include two each from the physical, biological and social sciences and the humanities, and two from the faculty at large. The Council gives regular consideration to such matters as the establishment of general policies with respect to the University's research and creative efforts, the review of policies and procedures concerned with securing and allocating funds for support of research and creative activity, and additional matters related to the general research and creative functions of the University and the health of basic scholarship on the campus.

Programs

With the advice of the University Research Council and other appropriately involved officers and committees of the University, the Office of the Vice-President for Educational Development and Research currently supports the following programs:

Junior Faculty Research Support

A limited amount of money is available each year from the National Institutes of Health for the support of the initial research efforts of junior faculty (other than those in the colleges of Medicine and Dentistry) who wish to do health-related research. To qualify, the faculty member must hold a full-time appointment as instructor or assistant professor. The funds may be used for any purpose which will assist the faculty member in conducting an initial exploration of a hypothesis which he or she believes may lead to the development of a full-fledged program of research.

Incidental Grants

Limited funds are also available in the Office of the Vice-President for Educational Development and Research for small grants to faculty members to cover the costs of materials, supplies, equipment, proposal writing, clerical and related assistance for specific research projects; for faculty travel related to specific research projects or for the purpose of acquiring skills, knowledge or techniques which will enhance research at the University; and for honoraria and expenses of visiting lecturers.

Services

The Office of the Vice-President for Educational Development and Research also provides support for several University-wide services required by faculty members engaged in research and creative activities. They include:

Computing Center

The Gerard P. Weeg Computing Center provides research and instructional computing facilities to all students, faculty, and staff of the University. The Center maintains systems capable of an extremely wide variety of applications as well as providing access to off-campus facilities by way of network connections. User access to these facilities is provided by a large number of terminals, both batch and interactive, conveniently distributed around the campus. The Center provides educational and consultative services, compatible with its resources, to assist the users in their computing activities. Although the Center is an entity distinct from the Computer Science Department, there is an interchange of students, faculty, and ideas between the two staffs.

Institute of Child Behavior and Development

The Institute advises students on programs of study and assists in the coordination of curricula in areas related to children; advises faculty which of their colleagues to contact to organize innovative training programs or interdisciplinary research projects in child-related fields; and advises those outside the University where to obtain consultation, discuss programs of continuing education or seek assistance in the performance of sponsored projects in this area. The Institute keeps abreast of federal, state, and foundation sources of support, and acts in a "lead agency" role in the development of projects bridging the relevant disciplines. The Institute is part of University House.

Division of Sponsored Programs

This office maintains a resource center of information on public and private agencies which provide funds for research and study. Included are references to pre- and postdoctoral fellowship awards, as well as application forms when available. Staff are available to locate potential funding agencies, assist in the preparation of budget and cover material, and give editorial assistance to achieve effective organization and technical correctness in an application. The staff also assists in processing an application through the University and in locating the appropriate contact in the prospective donor's office. Once an award is made, monitoring and advisory services are provided for matters other than expenditure accounting.

Scanning Electron Microscope Laboratory

The Laboratory was established in September 1971 to provide facilities and technical assistance to research programs involving the use of a scanning electron microscope. Located in the Zoology Building, the Laboratory is equipped with a Cambridge Stereoscan S4 having a resolution of 150 angstroms and a useful magnification range of 20 to 50,000 diameters. In 1974, the scanning electron microscope was modified to improve performance by the addition of a lanthanum hexaboride gun-ion pump system. The microscope is also capable of being interfaced with an energy dispersive X-ray spectrometer system for elemental analysis. There is a vacuum evaporator for specimen coating and a critical point drying apparatus for biological tissue preparation. Evaluation of several commercial scanning electron microscopes is presently underway, and a new and improved instrument should be installed and operational by summer 1978. A Balzer's freeze-fracture, freeze-etch instrument was added to the central facility in 1977 and is available for various research projects involving investigations into the organization of biological membranes. These facilities are available to all interested graduate students and faculty in the University.

Related Units

Although not directly connected with the Office of the Vice-President for Educational Development and Research, these units have a special role in the conduct of research at the University:

Agricultural Law Center

See "College of Law."

Center for Research in Interpersonal Behavior

See "Sociology" in "College of Liberal Arts."

Center for Research on the Psychological Disorders of Children

The Center fosters interdisciplinary research on psychological disorders of children and their relationships to normal behavior and development. The Center brings together members of the faculty and students interested in biologic, psychologic, and sociologic aspects of these disorders, and supports the collaboration of investigators from different colleges and departments. The Center also maintains an archive of data which is accessible to qualified investigators. The Center is currently housed in the Department of Psychiatry.

Child Development Clinic

The Child Development Clinic is an out-patient facility within the Division of Developmental Disabilities of the Department of Pediatrics in the University Hospitals. The Clinic is primarily a diagnostic clinic for developmental problems in children. The Clinic will provide a comprehensive study of any child under 18 years of age who has problems in development, speech and language, poor school performance or learning disability, hyperactivity, mild behavior problems, or psychological problems associated with medical conditions.

Clinical Research Center

The Clinical Research Center is a 13-bed in-patient, 2-bed out-patient facility at the University Hospitals. Its functions are to provide the setting for patient-oriented research on disease processes important in medical practice, and to permit studies of normal human physiology, biochemistry, and pharmacology. The Center is supported completely by the Division of Research Resources of the National Institutes of Health, on a semipermanent basis, by five-year grants-in-aid.

Comparative Legislative Research Center

The Comparative Legislative Research Center conducts programs of research on legislative behavior with special emphasis on the role of legislatures in political development. It provides research training

for graduate students and foreign research associates and facilitates collaborative research projects jointly undertaken by faculty at The University of Iowa and by foreign scholars.

Health Services Research Center

Organized to foster research, education, and demonstration projects relevant to the health needs of nonmetropolitan areas, the Center consists of a multidisciplinary core of scholars drawn from the colleges of Medicine, Dentistry, Nursing, Pharmacy, Education, Engineering, Business Administration, several social science departments in the College of Liberal Arts, University Hospitals and Clinics, and the Veterans Administration Hospital. These individuals have a mutual interest in improving the health services delivery system in Iowa, the Midwest, and the nation as a whole. The Center is part of University House.

Industrial Relations Institute

See "College of Business Administration."

Institute of Agricultural Medicine and Environmental Health

The Institute of Agricultural Medicine and Environmental Health, housed in the Agricultural Medicine Research Facility on the Oakdale Campus, is a part of the Department of Preventive Medicine and Environmental Health, College of Medicine. Research, teaching and extension activities are centered on the safety and health problems of those who live in rural Iowa. Areas of study include environmental toxicology, comparative medicine, occupational health, the Accident Prevention Laboratory and the Iowa Pesticides Epidemiology Studies Center.

Institute of Hydraulic Research

See "College of Engineering."

Institute of Public Affairs

The mission of the Institute is to improve state and local government and administration in Iowa. To fulfill this mission, the research and publication activities of the Institute seek to promote citizen understanding of and appreciation for their governments, help public officials better understand their roles and responsibilities, assist governments in their personnel development activities, and help public officials and citizens in their efforts to implement change. (See "Division of Continuing Education.")

Institute of Urban and Regional Research

Primary objectives of the Institute are to broaden knowledge in the area of urban and regional studies, to enrich the teaching programs in participating departments, and to initiate and carry out interdisciplinary research projects. Through the acquisition of grants and contracts and other on-campus activities, the Institute pursues these goals and provides an interface between faculty and students and their related discipline orientations in both basic and applied urban and regional research activities. The Institute is part of University House.

Two interdisciplinary graduate programs have been established within the Institute (see "Urban Transportation" and "Urban Growth in Developing Countries," in the "College of Liberal Arts" section of the *Catalog*). In addition, the Institute's Center for Locational Analysis provides a focus for investigating the spatial efficiency of public services.

Iowa Center for Communications Study

See "Journalism" in "College of Liberal Arts."

Iowa Center for Research in School Administration

See "College of Education."

Iowa Lakeside Laboratory

See "College of Liberal Arts" and "Division of Continuing Education."

Iowa Urban Community Research Center

The Iowa Urban Community Research Center was established in 1958 as a permanent interdisciplinary research and training agency. Its research has been disseminated in scholarly journals and in a reprint series and a monograph series. The Center's community surveys are on tape in its data bank and are readily available for secondary analysis by graduate students and faculty. The staff is currently engaged in a study of the relationship between juvenile delinquency and adult criminal careers in an industrial community.

Laboratory for Political Research

The Laboratory for Political Research is a research and training facility housed in the Department of Political Science. It provides technical assistance to faculty members, graduate and undergraduate students, and staff members engaged in research. This assistance includes both the data collection and analysis phases of research. The Laboratory serves the entire University community, regional schools in Iowa and Illinois, and public agencies at the local and state levels. It is involved in graduate education, directly training students to utilize the computer in their own research. It also provides empirical data which can be used in graduate courses and seminars, and supports a large number of computer programs which can be used for data analysis. For undergraduate education, the Laboratory works with professors in developing curriculum materials which utilize empirical data and the computer for instructional purposes. The Laboratory has published a number of computer-based curriculum packages. These instructional packages have been used at more that 50 institutions in the United States and Canada.

Management Center

See "College of Business Administration."

Radiation Research Laboratory (Radiation Biology)

See "College of Medicine."

Toxicology Center

The Iowa Center for Toxicology and Biochemical Pharmacology is an integral part of the Department of Pharmacology and is devoted to research in biochemical toxicology and pharmacology. Broadly, these include research on the disposition of drugs and poisons, their metabolic rate, the biological adaptation and regulation associated with their use, studies on their teratologic and toxic effects and their mechanism of action at the molecular level. Doctoral degrees in pharmacology are offered.

Social Science Data Archive

The Social Science Data Archive is a library of machine-readable data which can be analyzed by faculty and students in their research and training. Approximately 650 studies are now included in the Archive, covering most of the social science disciplines. Individuals wishing assistance in utlizing the data of the Archive can call on the staff of the Laboratory for Political Research.

University House

University House began in 1977 as a program dedicated to three separate but related missions. The first and most important is faculty development in general. To help faculty in their professional growth and advancement, University House provides on the Oakdale campus an environment, free from the usual distractions, in which faculty members can work—alone and together—on scholarly tasks in a congenial, supportive setting. It is also a place in which scholars from different disciplines can meet in easy interchange for mutual benefit.

As one means to foster these ends, University House sponsors many public lectures and conferences, visits by distinguished faculty from other campuses, and faculty seminars on a wide variety of topics. Faculty members in all disciplines are eligible for appointment and for participation in University House activities. Thanks to a large grant, University House is also able to support research and other educational development activities jointly pursued by faculty members from the University and from the independent, four-year colleges of Iowa.

In addition to promoting faculty development in general, University House is also a program which seeks to bring together university centers, institutes, committees, and other groups into consortial, interdisciplinary arrangements that foster the acquisition of external support for research, education, and appropriate service.

A third role for University House is to assist the Office of the Vice-President for Educational Development and Research in its efforts to serve as a broker in important joint-research efforts that serve the public policy concerns of the state government and the people of Iowa.

University House has nearly 6,000 square feet of newly furnished space in the Oakdale Hospital, including private faculty offices, several conference and project rooms, and a lounge. Secretarial services are available. Located in the same building are a cafeteria, an auditorium, a large conference room, a copy center, a batch terminal connected to the Weeg Computing Center, a terminal with text-editing capabilities, and a full-time assistant for computer services. Photocopying and book delivery services from University Libraries are also available. Half-hourly Cambus service connects University House with the main campus.

General Services

Iowa Center for the Arts

Located along the west bank of the Iowa River, the Iowa Center for the Arts is a major cultural resource, not only for the University community but for the people of the state and region. The Center comprises many of the academic units of the Division of Fine Arts in the College of Liberal Arts, together with the Museum of Art, E.C. Mabie Theatre, Clapp Recital Hall and Harper Hall in the School of Music, and Hancher Auditorium, the Center's newest and largest showcase.

Hancher Auditorium

Virgil M. Hancher Auditorium is one of the nation's finest facilities for a full range of programs in music, dance and theater. Although its 2,684 seats make it one of the United States' largest modern theaters, its design, coordinating functional with audiovisual excellence, achieves unusual intimacy. The Auditorium is named after Virgil M. Hancher, president of the University 1940-64.

Museum of Art

Impetus for the construction of the University's Museum of Art came from Owen and Leone Elliott, when they offered their superb art collection to the University. Opened in 1969, the Museum is located immediately north of the School of Art and Art History in the Center for the Arts complex along the west bank of the Iowa River. The Museum provides an architecturally unique setting for the widely representative works of the Elliott collection and the University's permanent collection, and for important touring exhibits. Addition of the Carver Galleries in 1976 significantly increased the Museum's display capacity.

Museum of Natural History

To meet the needs of the general public and the various departments of the University, the Museum provides a repository and the proper care for specimens which come to the University either by gift or through the efforts of its own collectors. It designs and executes new exhibits of educational value and offers instruction in the conceptual and technical phases of exhibit preparation and the general operational procedures of small science museums.

Habitat exhibits of North American mammals include the American bison, the antelope, the mountain lion, the American moose and the beaver.

A large and well-known bird habitat exhibit is the *Laysan Island Cyclorama*. This is a complete representation of a bird island of the Hawaiian group. Other habitat exhibits include the *Bering Sea*, the *Louisiana Swamp*, the *Fall Migration*, and *Cranes on South Dakota Prairie*. The crane exhibit includes both the sandhill crane and the rare whooping crane, as they appear on the prairie during migration.

The major invertebrate phyla are represented in several exhibits and include such familiar groups as the arthropods, mollusks, echinoderms and coelenterates.

Ethnological exhibits in the Museum present materials from many parts of the world. Indian and Eskimo materials, including beadwork and carved ivory received in the late nineteenth century, are exhibited. The ancestry of humans through 12 million years of time is portrayed in a display featuring replicas of fossil remains from Africa, Asia and Europe.

Several displays are related to the geology of Iowa and include typical fossil specimens.

Office of International Education and Services (OIES)

The OIES is the focal point for University international education activities. It works in the areas of international studies, international educational exchange and technical assistance.

The OIES seeks to promote the development of and cooperation among the various aspects of international studies — foreign language and area studies, comparative and topical studies, and foreign language

departments. It also assists faculty and students seeking grants or fellowships for study or research that have an international perspective.

The OIES seeks to encourage the development of formal linkages between University of Iowa departments and programs and their counterparts in foreign institutions by means of technical cooperation and faculty exchange programs.

The liaison officer for the Midwest Universities Consortium for International Activities (MUCIA) is located in the OIES and serves to involve UI faculty in MUCIA activities.

Foreign student advisers in the OIES provide assistance to foreign students, faculty and professionals on immigration and other matters relating to international educational exchange.

The International Center, a facility operated by the OIES, is open to all University and Iowa City community members who have international interests. Facilities and programs are designed to encourage the interaction between people of all cultures.

Additional OIES activities involving students are described in the *Catalog* section on "Student Services."

(Office of) Overseas Study and Travel Abroad

The Office of Overseas Study and Travel Abroad assists students, faculty, and staff who intend to study, work, or travel overseas. It helps faculty members design study abroad programs, facilitating arrangements for program publicity, transportation, orientation, and logistics. The Office offers individual counseling on all aspects of foreign travel, from planning to completion, and provides free materials designed specifically for the University community.

The Office maintains an extensive reference collection which includes foreign university catalogs, information on special collections and libraries overseas, lists of faculty and undergraduate and graduate programs at foreign universities, as well as study abroad programs offered by domestic and foreign institutions of higher learning. Students are assisted in selecting study abroad programs to complement their on-campus academic programs and to assure correct credit arrangements.

University Relations

The Office of University Relations seeks to foster understanding of, participation in, and support of University aims and activities through effective two-way communication within the University community and between the University and its key publics. The Office has management responsibility for the Office of Public Information, the Department of Publications and Printing Service, and The University of Iowa Press. In addition, the Office of University Relations seeks to maintain an effective information program through use of internal and external media, and provides liaison between the central administration and appropriate University and governmental groups. University Relations publishes the U of I *Spectator*, *Faculty and Staff Newsletter (FYI)*, *Campus Correspondent*, *Calendar of Events*, and *Programme*; provides campus tours and other services for University visitors and guests; provides copy and photos for some University publications, and serves as the executive office of the Parents Association.

Public Information

The Office of Public Information includes Humanities/Science News Service, Health Center Information and Communication, Men's Sports Information, Women's Sports Relations, Art Center Relations, and Broadcast News Services. These units supply news, photos and information to print and electronic media, gather and prepare informative material for special and general interest periodicals, help prepare special University publications, answer requests for information and assist writers, photographers and broadcasters who visit the campus.

Publications and Printing Service

The Department is responsible for providing services to meet official printing and publications needs of the University. The Publications staff provides assistance to departments and campus organizations in planning, writing, editing, and designing publications. Printing Service is the production agency of the Department, with a printing plant and bindery. Several Copy Centers located strategically about the campus provide quick, inexpensive reproduction service. The Department also operates Campus Stores, an on-campus distribution agency which sells manuals, lab notebooks, and other special instructional materials created by the faculty. The Department is responsible for ensuring University conformity with the printing laws of Iowa, including provision for obtaining competitive bids on printing not done in the University Printing Service.

University Press

The University of Iowa Press was established to publish the significant results of scholarly research. The imprint is controlled by the University Editorial Board, composed of faculty members and students appointed by the vice-president for educational development and research.

Reading Clinic

The Children's Reading Clinic in the University of Iowa College of Education trains classroom teachers, supervisors and consultants, school psychologists and counselors to assess the reading abilities of school-age children, and to recommend and use instructional materials which are suited to their needs and interests.

The Clinic teaching program includes practicums in Iowa City schools and in an on-campus diagnosis and treatment center during the academic year. During the summer the Clinic is in Wendell Johnson Speech and Hearing Clinic where the staff provides reading instruction for children who attend the Summer Residential Program for therapy in speech, hearing and reading. All the teaching that is under the auspices of the Children's Reading Clinic is done by student clinicians under the close supervision of Clinic staff members.

Recreational Services

The Division of Recreational Services administers a program of more than 20 intramural sports and recreational activities for all interested University students; offers a wide range of recreational lesson programs in such activities as karate, tennis, golf, yoga, aikido, judo and gymnastics; and provides informal activities for students, faculty and staff members, and their spouses and families. Activities include basketball, badminton, volleyball, table tennis, swimming, handball, paddleball, squash, canoeing, golf, archery, weight

training, billiards, spaceball, tennis, fencing and jogging. Bicycles, toboggans and cross-country skiing equipment are also available for a minimal renting fee.

The University of Iowa Alumni Association

The principal agency through which Iowa students continue their identity with the University after they leave campus is the University of Iowa Alumni Association. The Association was organized in 1867. Its current membership includes graduates and former students throughout the world. Its continuing objectives are to identify alumni with the University; to strengthen public recognition of the University as an institution vital to the stability and welfare of the state and the nation; and, through organized alumni effort, to serve the University in strengthening its programs in teaching, research and public service. The Association publishes the *Iowa Alumni Review*, a bimonthly magazine for Association members.

The University of Iowa Foundation

The University of Iowa Foundation was organized in 1956 to help the University obtain the greatest possible educational benefit from private giving. It raises funds for this objective through three major programs: annual giving, capital campaigns and planned or deferred giving.

The Foundation is a private, nonprofit corporation empowered to solicit and receive gifts and bequests, to accept trusts subject to the conditions imposed on them, and to hold, administer, manage, use or distribute gifts, bequests and trusts, all for the benefit of The University of Iowa. The Foundation is constantly at work to provide more funds for student financial aid, faculty development, library acquisitions and programs and projects throughout the University.

University Personnel Service

The University Personnel Service is responsible for meeting the employment needs of individuals and departments for the entire University complex. The office functions in the areas of recruitment, interviewing, screening, testing, placement and salary and fringe benefit administration for full-time and part-time, permanent and temporary, nonteaching and nonstudent employees of the University. The University Personnel Office is responsible for the administration of the Board of Regents Merit System and the Unemployment Compensation Act. It also participates in certain aspects of the academic personnel program and in payroll recordkeeping and collecting personal record data for both faculty and staff employees.

Libraries

Dean: Leslie W. Dunlap
University librarian: Dale M. Bentz
Assistant University librarians: Richard M. Kolbet, Wayne Rawley
Bibliographer: Frank S. Hanlin
Assistant director emerita: Grace Van Wormer
Acquisitions: Kathleen B. Wachel, *head*; Mirdza Berzins, Lawrence R. Gorman
Cataloging: Tatjana Lorkovic', *head*; David A. Aamodt, Georgianne M. Bordner, Mary G. Clark, Judith K. Groendyke, Vivian E. Hickman, Karl K. Kahler, George P. Mullally, Mary E. Noble, Richard G. Schrage, Leslie J. Scott, Ruth C. Tralster; Annellese M. Funke, Vong Kyih Nyi Mei, *emeritae*
Circulation: Susan Marks, *head*; Margaret Richardson, *browsing room librarian and reserved books librarian*; Clara Hinton, *head emerita*
Government publications: Carolyn W. Kohler, *head*; Frank T. Allen, Mary Lee Bleser, Mary R. McInroy
Reference: Julia Phipps, *head*; Barbara J. Flynn, David D. Hudson, Rebecca L. Johnson, Dorothy M. Kestel, Lucia A. Marino, J. David Martin, Ellen L. Palmer, Keith A. Rageth, Jean S. Schaal, John N. Schacht, Danny P. Wallace
Serials: Helen S. Clark, *head*; Ruth E. Christ, Jim E. Cole, Anne-Mieke Halbrook, Charlene E. Lehman, Mary E. Monson, Marjorie G. Wilhite
Special collections: Francis J. Paluka, *head*; Richard S. Green, Robert A. McCown, Earl M. Rogers
Departmental libraries: Harlan L. Sifford, *art*; Louise S. Zipp, *botany-chemistry and geology*; Terrence A. Brooks and Peter J. Hartford, *business administration*; Anne G. Evans, Dorothy M. Kibler, and Eunice M. Weech, *education-psychology*; John W. Forys, Jr., *engineering and mathematics*; David S. Curry, Robert W. Cryder, Richard Eimas, Edwin A. Holtum, Margery R. Jansen, Sharon L. Sandford, and Ruth C. Tralster, *health sciences*; Sandra S. Ballasch, *library science*; Rita B. Benton and Avery T. Sharp, *music*; and Jack B. Dickey, *physics and zoology*

General Facilities

The University's Main Library and its 12 departmental libraries contain approximately 2.1 million volumes. About two-thirds of this collection is in the Main Library.

The Art Library contains approximately 47,000 volumes: Botany-Chemistry, 56,000; Business Administration, 15,600; Education-Psychology, 111,800; Engineering, 45,350; Geology, 25,500; Health Sciences, 146,475; Library Science, 9,300; Mathematics, 28,900; Music, 53,430; Physics, 29,100; and Zoology, 25,150.

The Law Library, which is administered by the College of Law, contains 293,500 volumes.

Special Resources

Main Library facilities include microform reading rooms; listening rooms for collections of recorded drama, poetry, and speeches; seminar and conference rooms; a map center; carrels for graduate students; and individual study rooms for faculty members engaged in research. Other services include the reserved book stations for undergraduate students in the Burge and Hillcrest residence halls.

The *Human Relations Area Files* consist of full data on a sample of societies throughout the world, and are designed to facilitate comparative studies of social and cultural behavior.

The *Leigh Hunt Collection*, brought together by Luther A. Brewer of Cedar Rapids, Iowa, is considered one of the most complete in existence. It contains nearly 2,000 manuscripts and manuscript letters written by Hunt or to him by his many famous literary friends, 100 association volumes, and 600 editions of Hunt's writings.

The *Mark Ranney Memorial Collection* of approximately 3,700 volumes is particularly rich in deluxe editions, including many superb bindings made especially for Mrs. Ranney.

The *French Revolution Collection* includes more than 8,000 political pamphlets, chiefly from the years 1788-1799, supplemented by numerous French newspapers and government publications of the time.

The *John Springer Collection* on typography, given to the University by a long-time Iowa City printer, includes 1,850 volumes of type specimens, books important in printing history, and volumes illustrating the art and progress of printing through the centuries.

The *"Ding" Darling Collection* comprises originals of nearly 6,000 cartoons in which for more than 40 years Ding recorded and commented on the economic, political, and diplomatic affairs of the United States. His cartoons are virtually a pictorial history of this country during the first half of the 20th century. A subject index to the collection enhances its usefulness for reference and research.

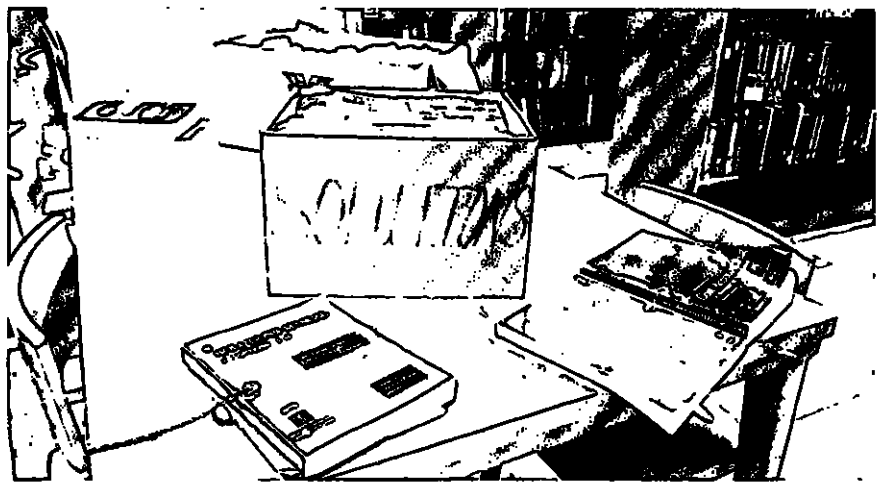
The *Bollinger-Lincoln Collection*, gathered by Judge James W. Bollinger of Davenport, is one of the best libraries of Lincolniana in the United States. A number of items in it concern John Wilkes Booth and the trial of his fellow conspirators. Another large group contains reminiscences of people who knew Lincoln. Lately, broadsides relating to Iowa and the Civil War Period have been added.

The *"X" Collection* is a gathering of early, rare or special works on diverse subjects, including books of the 15th and 16th centuries, early Americana, Roxburghe Club Publications, private press books, and selected modern first editions.

The *Manuscript Collection* includes more than 6,600 individually cataloged letters or manuscript items of English and American authors or historical figures, principally of the 19th and 20th centuries, in addition to 365 inventoried collections of papers, diaries and correspondence files relating to midwestern economic, political, and agricultural history.

Other special collections include the *Harvey Ingham Collection* of books dealing with the American Indian; the *Levi O. Leonard Collection* of manuscripts and documents dealing with railroading in the Midwest; the *History of Hydraulics Collection*; the *Edwin Ford Piper Collection* of ballads and folksongs; the *Chautauqua Collection*, which contains several thousand letters and

business documents descriptive of the Chautauqua movement; the *Blunden Collection* of poetry, biography and criticism, manuscripts, and letters relating to the contemporary English poet, Edmund Blunden; the *Iowa Authors Collection*, the *Map Collection*, containing more than 165,000 maps and indexed aerial photographs and nearly 2,500 atlases, gazetteers, and related reference items; and the *University Archives*.



College of Liberal Arts

People have many reasons for going to college. Some have specific careers in mind, while others are looking for guidance in seeking careers. Most expect that college will help prepare them for a wide variety of employment, social, and personal developments in their lives.

A liberal arts education is intended to ready students for effective performance in many situations over the course of their lives after graduation. It includes both preparation in specialties and a broad exposure to other areas of learning. Through the wide study of literature and language, mathematics, the physical, biological and social sciences, and the arts, students may gain a general understanding of the many types of situations and people they will meet after leaving college. Although this education often includes sound preparation for specific jobs, it also nourishes career flexibility by giving students broad bases for responding to changing employment opportunities. As a result, the danger that a graduate may become "locked" into a single unsatisfactory job is reduced.

The kind of flexibility and adaptability mentioned here are built upon an understanding of other cultures and languages, the social and political institutions in American society, communication behavior, and the physical and biological world about us. A liberal arts education includes something called a "general education" because students receive general preparation for the opportunities and problems they will encounter throughout their lives. This approach to education assumes that because we cannot now foresee all of these opportunities and problems, students are better prepared for the future if they have learned and developed abilities, awareness, sensitivities, and knowledge which will help them generate responses to unexpected events. The College of Liberal Arts attempts to provide this versatility by its combination of major and general educational requirements.

Schools and Divisions

There are seven schools and two divisions in the College of Liberal Arts. The Division of Fine Arts includes the School of Art and Art History, the School of Music and the Department of Speech and Dramatic Art. The Division of Mathematical Sciences includes the departments of Computer Science, Mathematics and Statistics. The School of Letters is a federation of the departments of Classics, East Asian Languages and Literature, English, French and Italian, German, Linguistics, Russian, Spanish and Portuguese, and Speech and Dramatic Art; the programs in Afro-American Studies, American Civilization, Comparative Literature and Modern Letters, the International Writing, Translation and Writers Workshops; and the Windhover Press. There are also schools of Journalism, Library Science, Religion and Social Work.

Degrees Offered in the College

Degrees offered: B.A., B.S., B.F.A., B.M., B.G.S., B.L.S.

The College of Liberal Arts confers degrees in the following major fields:

American Studies—B.A.
Ancient Civilization—B.A.
Anthropology—B.A.
Art—B.A., B.F.A.
Asian Studies—B.A.
Astronomy—B.A.
Biochemistry—B.A., B.S.
Botany—B.A.
Chemistry—B.A., B.S.
Classics—B.A.
Communication Studies—B.A.
Computer Science—B.A., B.S.
Dance—B.A.
Dental Hygiene—B.S.
Early Childhood Education—B.A., B.S.
East Asian Languages and Literature—B.A.
Economics—B.A., B.S.
Elementary Education—B.A., B.S.
English—B.A.
French—B.A.
General Science—B.A., B.S.
Geography—B.A., B.S.
Geology—B.A., B.S.
German—B.A.
Greek—B.A.
Health Occupations Education—B.S.
History—B.A.
Home Economics—B.A., B.S.
Italian—B.A.
Journalism—B.A., B.S.
Latin—B.A.
Letters—B.A.
Linguistics—B.A.
Literature, Science and the Arts—B.A.
Mathematical Sciences—B.A., B.S.
Microbiology—B.S.
Music—B.A., B.M.

Administrative staff: *dean* Howard Laster
associate dean and director of the Advisory Office Hugh E. Kelso
associate dean Sherwood D. Tuttle
assistant dean Nancy Harper
director of Honors Rhodes Dunlap
associate director of Honors J. Richard Wilmeth

Philosophy—B.A.
Physical Education—B.A., B.S.
Physics— B.A., B.S.
Political Science—B.A., B.S.
Portuguese—B.A.
Psychology—B.A., B.S.
Recreation Education—B.S.
Religion— B.A.
Russian—B.A.
Social Studies—B.A.
Social Work— B.A.
Sociology—B.A., B.S.
Spanish—B.A.
Special Education—B.A., B.S.
Speech and Dramatic Art—B.A.
Speech and Hearing Science—B.A., B.S.
Zoology—B.A., B.S.

Basic Program

Except for the degrees Bachelor of General Studies and Bachelor of Liberal Studies, the basic program for baccalaureate graduation from the College of Liberal Arts consists of:

General Requirements

Core areas
- Historical-cultural
- Literature
- Natural science
- Social science

Foreign language
Mathematics
Physical education skills
Rhetoric

Area of Concentration (major)

Electives

Typically, the student takes about one-third of his or her coursework in each of the three groups—general requirements, major requirements, and electives—focusing on the general requirements the first two years and on the area of concentration during the junior and senior years. The general requirements, and methods of meeting them, are explained in detail at the end of this section.

Bachelor of General Studies

The program leading to the Bachelor of General Studies degree provides for broad flexibility, rather than the traditional single major. Of the general requirements listed above, only the rhetoric skills requirement (one semester) applies to the General Studies program. For the General Studies degree, the student must earn at least 45 semester hours of credit in University of Iowa courses numbered above 99, and must achieve at least a 2.0 grade-point average in all these courses. No more than 20 100-level credits earned in one department can be applied toward the 45-credit requirement, and no more than 40 credits total earned in one department can be applied toward graduation.

Bachelor of Liberal Studies

The B.L.S. program is designed to serve adults who cannot attend the College as full-time, on-campus students. The program has no residence requirement. Work done in community and private colleges in Iowa and in accredited out-of-state colleges can be applied toward the degree, as well as applicable courses taken from any of the three Iowa Regents universities. Types of courses available from the Regents universities include correspondence courses; radio, television and newspaper courses; Saturday and evening courses; extension courses including those with new distance-learning formats; and regular on-campus and daytime courses. Students may also take proficiency examinations.

To be eligible for admission to the program the student must have earned either an Associate in Arts (A.A.) or Associate in Science (A.S.) degree from an accredited institution or 62 semester hours of collegiate work acceptable for credit toward graduation. The student must satisfy the College's basic skills and core course requirements; holders of the A.A. or A.S. degree will have already met these requirements.

Of the 124 semester hours of credit required for the degree, at least 45 must be earned in four-year colleges, in courses defined as upper-level where the credits were earned (in the College of Liberal Arts, courses numbered 100 and above); 45 must be completed in courses offered by the Iowa Regents universities; and 30 must be earned after admission to the B.L.S. program in the specific Regents university which will grant the degree.

The B.L.S. candidate must meet the general education requirements of the Regents university from which the candidate expects to receive the degree, and, in addition, must earn at least 12 semester hours (or 18 quarter hours) of credit in each of three of these areas:

Humanities
Communications and arts
Natural sciences and mathematical disciplines
Social Sciences
Professional fields, as approved by the degree-granting institution

Of these 36 semester hours, 24 must be in upper-level courses, and of these 24, at least six must be in each of the three selected distribution areas. Credits applied to the general education requirements may not be used to meet the distribution area requirements.

Graduation requires a minimum grade-point average of 2.0 in all coursework applied toward the degree, in all coursework completed after admission to the program, and in all upper-level coursework.

While the B.L.S. is awarded by the College of Liberal Arts, the program is administered by the Division of Continuing Education. Address inquiries to: Credit Programs, W400 East Hall.

Two or More Bachelor's Degrees

Students who have already received a bachelor's degree and wish to qualify for an additional bachelor's degree must meet requirements for the second degree and complete at least 30 additional hours of study in residence in the College of Liberal Arts beyond the first degree.

Double Majors

Students may meet the major requirements in more than one department and if both departments award the same degree the student may earn a bachelor's degree with two majors, e.g., B.A. in History and English; B.S. in Psychology and Sociology. No double majors can be earned between colleges of the University.

Credit Requirements

Graduation from any College of Liberal Arts baccalaureate program requires a minimum of 124 semester hours of college credit, of which at least 90, or the last 30 consecutive, or 45 of the last 60, must be earned in residence in the College.

Maximum Credit in One Department

No more than 50 semester hours of credit earned in one department may be applied toward College requirements for the Bachelor of Arts or Bachelor of Science degrees.

Transfer Credit Limit

After a student has earned 62 semester hours of college credit from all sources, no more credit can be accepted by transfer from a two-year college toward the 124 semester hours needed for graduation from the College of Liberal Arts.

Correspondence Credits

No more than 30 semester hours of credit earned in correspondence courses may be applied toward College requirements for baccalaureate graduation.

Classification

Freshman: less than 28 semester hours earned
Sophomore: 28 through 55 semester hours earned
Junior: 56 through 89 semester hours earned
Senior: more than 89 semester hours earned

Semester Load Limit

The normal schedule is 15-16 semester hours for a semester, eight for a summer session. No student may register for more than 20 semester hours in one semester, or 10 in a summer session, without the permission of the Liberal Arts Advisory Office.

Academic Standards

Marking System

The College uses the 4-point marking system, in which grade points are awarded on a scale descending from A=4. For a full description, see the General Information Section of the *Catalog*.

Grade-Point Requirements for Graduation

Baccalaureate graduation from the College generally requires at least a 2.0 average (1) on all college-level work attempted, (2) all work attempted at the University, (3) all work attempted in the major field, and (4) all work in the major field at the University.

A student who does not meet the requirements in (1) but who does have a cummulative grade-point average of at least 1.9 on all college work attempted and on all work attempted at The University of Iowa, and a 2.0 in the major, both cumulative and at the U of I, may satisfy the requirement by earning sufficient grade points to equal or exceed a figure obtained by multiplying by two the number of hours required for graduation at the time of entrance.

The cumulative grade-point average is computed as follows: (1) multiply hours of credit in each course by the appropriate grade points; (2) total the grade points earned to date; (3) divide the sum in (2) by the number of hours undertaken, excluding courses in which grades of "W" or "P" are given. Grades of "F" are included in hours attempted and are used in computing the grade-point average.

Good Standing

Minimum University of Iowa and overall cumulative grade-point averages required for good standing in the College are 1.5 for freshmen, 1.6 for sophomores, 1.75 for juniors, and 1.9 for seniors.

Pass-Fail Option

All students in the College have the option of taking courses on a pass-fail basis.

The student must have the consent of his or her faculty adviser and the course instructor, and must file a completed pass-fail card either during registration or at the Registrar's Office before the end of the third week of classes (second week in a summer session).

The student may apply no more than 16 semester hours of "pass" credit towards the bachelor's degree, and may earn this credit only in rhetoric, physical education skills, 22M:1 Basic Mathematical Techniques and/or elective courses.

A student may not take courses in his or her major department on a pass-fail basis, but courses required for the major in cognate or related areas may be taken on a P/F basis, if available, at the discretion of the major department.

A student may register for only two P/F courses per semester and/or summer session.

For transfer students with more than 55 semester hours of transfer credit, the "pass" credit limit is eight.

"Fail" grades in pass-fail courses are included in the computation of grade-point averages.

Satisfactory-Fail Courses

Certain courses are offered only on a satisfactory-fail basis. All students in such courses are graded this way. No more than 16 semester hours of credit earned in such courses may be applied toward graduation. A student may take satisfactory-fail courses in his or her major department. No special form is required for satisfactory-fail registration. "Fail" grades in satisfactory-fail courses are included in the computation of grade-point averages.

Auditing Courses

Students in the College of Liberal Arts may register for zero credit (audit) with the permission of the instructor and the advisor. The mark of "R" (registered) is assigned to those registered for zero credit if attendance and performance are satisfactory; if unsatisfactory, the mark of "W" (withdrawn) is assigned. Courses completed with a mark of "R" do not meet any graduation requirements. The listed semester hours credit for the course will be used in assessing tuition fees.

Second-Grade-Only Option

Unless obvious regression is involved, a student may repeat a University course and have only the second grade and credit included in computation of the grade-point average. A student who wishes to utilize the provisions of this rule should come to the Liberal Arts Advisory Office to complete the necessary form.

Incomplete and No Report

A mark of "I" (incomplete) or "0" (no report) which is not replaced by a final grade prior to the announced deadline within the student's next regular semester of registration will be replaced by a final grade of "F," except that students with incompletes from the spring semester are exempt from completing the course during the succeeding summer session.

Readmission After Academic Dismissal

A student dropped from the College for the first time for failure to meet academic requirements may apply for readmission after one year. A student dropped for a second time may not apply for readmission until five years later.

Recognition for Academic Achievement

The College awards degrees "with highest distinction" to students in the highest 2 percent of the graduating class, "with high distinction" to students in the next highest 3 percent, and "with distinction" to students in the next highest 5 percent. Ranking is based on students' grade-point averages for all college-level study undertaken prior to their final registration.

The College also awards degrees "with Honors" to students who have satisfied the requirements for an Honors major, receive departmental recommendation and are approved by the College's Honors Council and dean.

To be eligible for either form of recognition, the student must take his or her final 60 semester hours of study in residence in the College, and must have completed at least 45 semester hours of study in the College before his or her final registration.

Dean's List

Liberal Arts students achieving grade-point averages of 3.5 or above during a given semester on 12 or more semester hours of graded work with no "I's" or "0's" still standing on the current or past semester's record, are recognized by inclusion on the Dean's List for that semester.

Special Programs

Advanced Placement

Under the Advanced Placement Program of the College Entrance Examination Board, a high school senior may take comprehensive achievement examinations in a number of subjects. The College of Liberal Arts grants college credit and, where appropriate, advanced placement of students who achieve satisfactory standards in these examinations. For information, write to the College Entrance Examination Board, 475 Riverside Drive, New York, N.Y. 10027.

Credit by Examination

A student may earn up to 32 semester hours of credit, and/or course exemption, in the general education program of the College, or in certain departmental courses, through tests offered in the College-Level Examination Program (CLEP) of the College Entrance Examination Board. Information about the tests and permission to take them may be obtained from the Liberal Arts Advisory Office.

Foreign Studies Certificate

The College's Foreign Studies Certificate program is designed for undergraduate students who seek to broaden their knowledge of societies other than their own. The program is supplemental; the certificate is not a substitute for a major. The chairs of the various language departments serve as advisers to students in preparing for the certificate. After selecting an area or country of interest, students wishing to earn the certificate will be guided by the appropriate chair in choosing a group of courses designed to provide a basic understanding of the area or country. Courses may include work in geography, history, anthropology, art, literature, political science or other fields offering international studies.

Programs leading to the certificate will include at least 18 semester hours in coursework related to the chosen country or area. In addition, students fulfill the foreign language requirement for the B.A. in a language appropriate to the chosen country or area. A student who successfully completes a Foreign Studies course program designed by the appropriate departmental chair receives the Foreign Studies Certificate with his or her degree.

Interested students should consult the chair of the appropriate department:

Classics (Ancient Greece or Rome)
East Asian Languages and Literature (India, China, or Japan)
French and Italian (France or Italy)
German (Germany or Austria)
Russian (Russia or Eastern Europe)
Spanish and Portuguese (Spain, Portugal, or Latin America)

Honors

The Honors Program is a College-wide plan for exceptionally promising students. Honors students are assigned to special sections in general studies courses. Those whose major departments offer Honors curricula have opportunities to enhance their studies in Honors seminars, independent research and other special activities, and to earn the baccalaureate degree "with Honors." Entering freshmen whose records indicate they would benefit from the Honors Program are invited to participate. However, the Program is open to all interested and qualified students.

Preprofessional (Joint Programs)

Joint programs leading toward graduation from the College of Liberal Arts may be used with the University of Iowa College of Medicine, the University of Iowa College of Dentistry, any accredited medical or dental college in the United States which offers advanced degrees, and the University of Iowa College of Engineering.

To be eligible to use a joint program with the above colleges toward graduation from The University of Iowa, a student must have completed all of the following prior to going to a "professional" college:

Earned at least 94 s.h.;
Satisfied skills, cores, and foreign language requirements;
Met the requirement for the major; and
Satisfied the residence requirement of the College.

After the student completes the first year of medical or dental college, The University of Iowa will, upon presentation of a transcript, award a student 30 s.h. of ungraded elective credit. These credits may be applied toward a University of Iowa degree.

To use a joint program with any college

except the University of Iowa, a student during his last semester in residence at Iowa should apply to the Graduation Analysis Section of the Office of the Registrar for permission to use this joint degree program. If the student meets the requirements listed above and will be attending an accredited medical or dental school, the Registrar will instruct the student how to proceed toward applying for a University of Iowa degree.

With the University of Iowa College of Engineering, students first meet all the College of Liberal Arts requirements, plus those of a major department, and then complete degree requirements for a major in the College of Engineering. This is a five-year program (three in Liberal Arts and two in Engineering). The student receives two degrees at the time he/she completes the Engineering program.

Liberal Arts Advisory Office

The Liberal Arts Advisory Office functions as an integral part of the Office of the Dean of Liberal Arts.

Every undergraduate student enrolled in the College has an academic adviser, selected from the faculty, to help the student with registration and the progressive development of the educational program which will best prepare the student to pursue his or her life goals. Faculty advisers are assigned by the Advisory Office. Students who have declared majors are assigned advisers from their major departments; those who have not declared majors are assigned advisers from the Liberal Arts faculty at large; those in preprofessional programs are assigned special advisers from the appropriate professional areas.

Students should go to the Advisory Office to change faculty advisers, declare or change majors, determine the advisability of their taking tests in the College-Level Examination Program (the Advisory Office administers CLEP for the College and assigns credit for satisfactory CLEP scores) and determine their eligibility to use the Second Grade Only option; for information and/or advice about College requirements for graduation, pass-fail and satisfactory-fail; concerning deadlines for various administrative actions (such as dropping courses, adding courses, canceling registration) within the College; for information about the Bachelor of General Studies degree program; and concerning probation, dismissal, reenrollment, academic discipline and any other academic matter.

General Course Requirements

(Note: Graduation from an accredited junior college with an A.A. or A.S. degree and at least 60 semester hours of transfer credit satisfies all College of Liberal Arts general course requirements outlined below, except the foreign language requirement.)

Core Requirements

There are four core areas: historical-cultural studies, literature, natural science and social science. All students may satisfy the core requirements by earning in each core area eight semester hours of credit in core courses offered in that area, or in departmental courses approved for core purposes.

These requirements may be met in part or totally by satisfactory performance in approved tests from the College-Level Examination Program (CLEP). With the approval of his or her major department, a student may be excused from the core requirement in the area of his or her major.

Except in literature, core courses may be taken as electives. No core courses or departmental courses used to meet core requirements may be taken pass/fail if they are to be used toward satisfying the core requirements of the College.

Core courses and approved departmental options in the four core areas are as follows:

Historical-Cultural Core

This requirement may be met by any combination (nonduplicating) of the following courses totaling 8 s.h.

(Transfer students may meet the requirement with eight semester hours of transfer credit in core-equivalent courses in history, philosophy, religion, American civilization, or art, music or drama history and appreciation.)

11:29 Problems in Human History **3-4 s.h.**
Introduction to learning about past and its meaning; various topics in world history; emphasis on methods of investigating and forming ideas about evidence, as well as on critical evaluation of what historians have already written about the subject.

11:30 Problems in Human History **3-4 s.h.**
Introduction to learning about past and its meaning for present; various topics in world history; emphasis on methods of investigating and forming ideas about evidence, as well as on critical evaluation of what historians have already written about the subject.

11:31 Western Civilization **4 s.h.**
Evolution of Western civilization with emphasis on political, social, economic and cultural development of Europe, as related to problems of our own time.

11:32 Western Civilization **4 s.h.**
Evolution of Western civilization with emphasis on political, social, economic and cultural development of Europe, as related to problems of our own time.

11:33 Philosophies of Man **4 s.h.**
Discussion of great philosophical ideas about life and society, knowledge and human ideals, reality and the universe. Either semester may be taken first. Same as 26:33.

11:34 Philosophies of Man **4 s.h.**
Discussion of great philosophical ideas about life and society, knowledge and human ideas, reality and the universe. Either semester may be taken first. Same as 26:34.

11:35 Religion in Human Culture **4 s.h.**
Examples from non-Western and Western cultures; selected historical and systematic aspects of Hinduism, Buddhism, Islam, Judaism and Christianity. Same as 32:35.

11:36 Religion in Human Culture **4 s.h.**
Interrelationship between religion and culture; selected aspects of religion and its relation to society, literature and art, politics, ethics; illustrations chiefly from Western culture. Same as 32:36.

11:37 Form and Theory in the Visual Arts **4 s.h.**
Elements of theory of art and art criticism. Fall.

11:38 Art in the Western World **4 s.h.**
Periods, styles and great personalities in painting, sculpture and architecture from prehistoric times to present. Spring.

11:39 Masterpieces of Music **4 s.h.**
Representative music from classical repertory of 18th, 19th and 20th centuries; recordings and programs by faculty, soloists and groups; lecture-commentary and prescribed outside readings and reports.

11:40 Masterpieces of Music **4 s.h.**
Representative music from classical repertory of 18th, 19th and 20th centuries; recordings and programs by faculty, soloists and groups; lecture-commentary and prescribed outside readings and reports.

11:42 Art in East and West **4 s.h.**
Great styles and monuments of world art; important works of Oriental and European architecture, sculpture and painting analyzed and compared within their respective historical contexts.

11:46 Living Religions of the East **4 s.h.**
Selected historical and systematic aspects of the religions of India, S.E. Asia, China and Japan. Same as 32:46, 39:46.

11:51 Drama in Western Culture **4 s.h.**
Theatre in society; plays and productions, aims and ideas; from classical Greece to seventeenth-century France; parallels in painting, sculpture and architecture. Same as 36T:51.

11:52 Drama in Western Culture **4 s.h.**
From English Restoration to present. Either 11:51 or 11:52. May be taken independently. Same as 36T:52.

11:55 Civilizations of Asia **4 s.h.**
Introduction to the traditional cultures and societies of the three major civilizations of Asia: India, China, and Japan. Same as 39:55.

11:56 Civilizations of Asia **4 s.h.**
Introduction to the modern history and present condition of

India, Japan, and China. Continuation of 11:55, but may be taken also in combination with any of 11:29-32. Same as 39:56.

Literature Core

Satisfaction of the rhetoric skills requirement (see below) is prerequisite to registration for core coursework in literature.

The literature core requirement may be satisfied by completion of 11:1 The Interpretation of Literature, followed by any other core course.

All core courses in literature ask for substantial independent reading, and stress writing as a tool for learning and communication. Readings are selected from the present as well as the past. Courses emphasize both the artistic structures and the personal and social implications of literary works.

Detailed course descriptions and book lists are posted in the English-Philosophy Building.

(Transfer students may meet the literature core requirement with six semester hours of transfer credit in literature, or with three semester hours of transfer credit and four semester hours of University credit in an approved literature core course.)

11:1 The Interpretation of Literature 4 s.h.
Exploration of poetry, short fiction, and the novel, mainly English and American. A prerequisite for all other literature core courses.

11:2 Biblical and Classical Literature 4 s.h.
Selections from Old and New Testament literature, Homer, Greek dramatists, Plato, Virgil, and others. Prerequisite: 11:1.

11:3 Medieval and Renaissance Literature 4 s.h.
Selections from Beowulf, Dante, Chaucer, Shakespeare, Milton and others. Prerequisite: 11:1.

11:4 Idea of Tragedy 4 s.h.
Major representations of tragic vision of man's experience in narrative prose and drama from classical times to present. Prerequisite: 11:1.

11:5 The Idea of Comedy 4 s.h.
Varieties of comic view of life past and present, including satire, burlesque, farce, romance, in prose and verse. Prerequisite: 11:1.

11:6 Narrative Literature 4 s.h.
Selected masterpieces as well as recent developments in art of storytelling in both poetry and prose. Prerequisite: 11:1.

11:7 Lyric Poetry 4 s.h.
Poetry from major periods of development as well as contemporary verse, with emphasis on distinctive language and major formal patterns of poetry. Prerequisite: 11:1.

11:8 Literature of the Theater 4 s.h.
Selected plays from Shakespeare's time to present with some consideration of dramatic motive and form in other genres. Prerequisite: 11:1.

11:9 American Lives 4 s.h.
Major works of American autobiography from Thoreau to the present. Prerequisite: 11:1.

11:10 French Literature of Commitment 4 s.h.
Masterpieces of 19th- and 20th-century literature, in English translation. Prerequisite: 11:1. Same as 9:10.

11:13 The Classical Views 4 s.h.
Readings from Homer, Virgil, St. Augustine and Apuleius in English translation. Prerequisite: 11:1. Same as 14:13.

11:14 Literatures of the African Peoples 4 s.h.
Selected works in English by authors of African descent from America, continental Africa, and the Caribbean. Prerequisite: 11:1. Same as 45:8.

11:15 The Literary Presentation of Women 4 s.h.
Works from various genres and time periods focusing on the presentation of women by both male and female writers. Prerequisite: 11:1.

11:17 German Heroic and Erotic Literature of the Middle Ages 4 s.h.
Three epic masterpieces, Parzival, Tristan and the Nibelungenlied, and other readings from the period, in English translation. Same as 13:17.

11:18 Contemporary Latin American Narrative 4 s.h.
Themes and narrative techniques of major authors of the continent, in English translation. Prerequisite: 11:1. Same as 35:8.

11:19 Asian Humanities 4 s.h.
Characteristic literary texts of China or India in English translation. Offered in fall. Prerequisite: 11:1. Same as 39:19, 106:19.

11:20 Asian Humanities 4 s.h.
Characteristic literary texts of Japan in English translation. Offered in spring. Prerequisite: 11:1. Same as 39:20, 106:20.

Natural Science Core

This requirement may be met by any combination (nonduplicating) of the following core and approved departmental courses totaling 8 s.h.

(Transfer students may meet this core requirement with eight semester hours of transfer credit in core-equivalent courses in astronomy, biochemistry, botany, chemistry, geology, mathematics, microbiology, physics and zoology.)

Life Science

11:21 Human Biology 4 s.h.
Human evolution, reproduction, genetics and races; integrated functions of our biological systems from cells to behavior; our place in and problems with our environment. Lecture, laboratory, discussion. Independent of 11:22.

11:22 Ecology and Evolution 4 s.h.
An overview of directions of evolution and of diversity of living things, their patterns on earth, their organization in ecological systems and dynamics of evolutionary processes. Lecture, laboratory, discussion. Independent of 11:21.

Earth History and Resources

11:23 Earth History and Resources 4 s.h.
Formation of rocks, mineral resources, evolution, landscapes, river management, earthquakes, mountain-building, continental drift; for nonscience students. Lectures, laboratory. Not open to students who have had 12:1, 12:3, 12:5.

11:24 Man and His Physical Environment 4 s.h.
Climate, air pollution, processes that create natural environments, our energy resources and problems, environmental geology. Lectures, laboratory. For non-science students. Not open to students who have had 12:2, 12:4.

Physical Sciences

11:25 Chemistry and Physics of the Environment 4 s.h.
Chemistry and physics of ecology of our planet; air, earth, water and noise pollution, return of pollutants to man, chemistry and physics of balance of nature; all relevant principles of physics and chemistry at elementary level. For nonscience students. Lecture, discussion. Same as 29:5.

11:26 Technology and Man 4 s.h.
Develops selected areas of chemistry from basics to modern research and applications. For nonscience majors. Lectures, discussion, laboratory.

Departmental Options

Any of the courses listed below may be used in any combination (except as indicated) with any other courses on this or the above core list to satisfy the natural science core requirement. For descriptions of the departmental courses, see the appropriate departmental section of the *Catalog*.

Botany

2:1 Introduction to Botany	4 s.h.
2:11 Plant Diversity	4 s.h.
2:13 Biology of the Local Flora	4 s.h.

Chemistry

4:13 Principles of Chemistry I	3 s.h.
or	
4:7 General Chemistry I	3 s.h.
4:14 Principles of Chemistry II	3 s.h.
4:16 Elementary Chemistry Laboratory I	2 s.h.
4:8 General Chemistry II	3 s.h.
4:9 General Chemistry Laboratory	2 s.h.

General Science
(Only for students majoring in elementary, special, or early childhood education)

Students with no college science take:

97:55-56 Science Foundations I-II	6 s.h.
22M:80 Theory of Arithmetic	3 s.h.

Students with four or more semester hours of college science take:

97:104 Science Foundations III	arr.
22M:80 Theory of Arithmetic	3 s.h.

Geology

12:5 Introduction to Geology	4 s.h.

(may not be taken in combination with 11:23)

Mathematics

22M:10 Fundamentals of College Mathematics I 4 s.h.
or
22M:11 Fundamentals of College Mathematics II 4 s.h.

Physics and Astronomy

29:11 College Physics 4 s.h.
or
29:17 Introductory Physics I 4 s.h.

29:12 College Physics 4 s.h.
or
29:18 Introductory Physics II 4 s.h.

29:8 Basic Physics 4 s.h.
(may not be combined with any other physics core option)
29:50 Modern Astronomy 4 s.h.
29:61 General Astronomy 4 s.h.
29:62 General Astronomy 4 s.h.
29:105 General Astronomy 4 s.h.

Zoology

37:3 Principles of Animal Biology 5 s.h.

Social Science Core

The social science core requirement may be met with eight or more semester hours of credit earned in any combination of courses listed below. For course descriptions, including prerequisites, see the appropriate departmental section of the *Catalog*.

(The social science core option for transfer students is eight semester hours of transfer credit in core-equivalent courses in anthropology, economics, geography, political science, psychology and/or sociology.)

Anthropology

113:3 Introduction to the Study of Culture and Society 4 s.h.
113:10 The World's Peoples 4 s.h.

Economics

6E:1 Principles of Economics 4 s.h.
6E:2 Principles of Economics 4 s.h.

Geography

44:1 Introduction to Human Geography 4 s.h.
44:2 Natural Environment and Man 4 s.h.
44:11 Introduction to Social Geography 4 s.h.
44:19 Natural Environmental Issues 2 s.h.
44:30 Introduction to Economic Geography 3 s.h.
44:35 Introduction to Urban Geography 3 s.h.

Linguistics

103:11 Language and Society 4 s.h.

Political Science

30:1 Introduction to American Politics 4 s.h.
30:2 Introduction to Politics 4 s.h.
30:50 Introduction to Political Behavior 4 s.h.
30:30 Introduction to Political Theory 4 s.h.
30:40 Introduction to Comparative Politics 4 s.h.
30:60 Introduction to World Politics 4 s.h.
30:110 The American Political System 4 s.h.

Psychology

31:1 Elementary Psychology 4 s.h.
or
31:3 General Psychology 4 s.h.

Sociology

34:1 Introduction to Sociology: Principles 4 s.h.
34:2 Introduction to Sociology: Problems 4 s.h.

Foreign Language Requirements

The Bachelor of Arts degree requires at least four semesters of college-level study in any of the foreign languages taught in the University. The requirement may also be satisfied by completion of four years of high school study in one language, completion of a combination of high school and college study in one language which would be the equivalent of four semesters of study on the college level, or satisfactory performance in an achievement examination measuring proficiency equivalent to that usually attained after four semesters of college study in one language.

The Bachelor of Fine Arts, Bachelor of Music and Bachelor of Science degrees require at least two semesters of college-level study in any one of the foreign languages taught in the University. The requirement may also be satisfied by completion of two years of high school study in one language, completion of a combination of high school and college study in one language which would be the equivalent of two semesters of study on the college level, or satisfactory performance in an achievement examination measuring proficiency equivalent to that usually attained after two semesters of college study in one foreign language.

Students taking French may satisfy the foreign language requirement for the B.A. degree by taking a sequence of courses culminating in 9:12 Intermediate French or 9:28 Second-Year Composition and Conversation or a combination of 9:27 Second-Year Composition and Conversation and 9:26 French Conversation First Level; 9:26 alone is not sufficient for the fourth-semester requirement. Other combinations are possible. Check with the French Department.

Elementary Chinese or Japanese courses, 6 semester hours each for a total of 12 s.h., will meet the foreign language requirements for the B.A. degree. One semester, 6 s.h., of these langauges will meet the foreign language requirement for the B.F.A., B.M., or B.S. degree.

No foreign language is required for the Bachelor of General Studies or the Bachelor of Liberal Studies degree.

No foreign language courses may be taken pass/fail if they are to be used toward satisfying the foreign language requirement of the College.

Mathematics Requirement

The general requirement in mathematics can be met by at least two and one-half years of high school mathematics, or a minimum score of 23 on the mathematics section of the American College Tests, or completion of the University course 22M:1 Basic Mathematical Techniques or a mathematics, statistics, or computer science course taught in the Division of Mathematical Sciences.

(Transfer students may meet this requirement with transfer credit in mathematics, statistics or computer science.)

Physical Education Skills Requirement

This requirement may be met with four semester hours of credit in the physical education skills courses, or by satisfactory performance in any of the comprehensive physical educational skills tests given at announced times each semester. The student may receive up to four semester hours of ungraded credit for successful completion of the test.

Freshmen who take the test but fail it must register for physical education skills for at least one semester before attempting the test again. Students who have not passed the test before the beginning of the sophomore year must register for physical education skills coursework at that time; those who wish to may take the sophomore course for no credit. No more than four semester hours of credit in physical education skills may be counted toward a baccalaureate degree.

Students who have passed their 23rd birthday prior to their first registration in the University are excused from the physical education skills requirement.

Students who present evidence of having completed a basic training program in some branch of military service may be excused from the requirement.

Transfer students may meet the requirement with four semester hours of transfer credit in physical education. Transfer students admitted to the University with more than 40 semester hours of transfer credit are excused from the requirement. Transfer students transferring less than four semester hours of physical education credit and less than 40 hours total credit must complete the four-hour requirement at Iowa.

The instructional program in physical education skills provides for a wide variety of activities. The program also gives the student an opportunity to correct physical defects which respond to therapeutic exercises.

Courses with which the student can meet the requirement are:

10:21 Physical Education Skills **2 s.h.**
Basic instruction in student's choice among a wide variety of team and individual sports, physical and recreational activities. See current *Schedule of Courses* for skills offered.

10:22 Physical Education Skills **2 s.h.**
Description same as for 10:21.

10:31 Physical Education Skills **2 s.h.**
Description same as for 10:21.

10:32 Physical Education Skills **2 s.h.**
Description same as for 10:21.

Rhetoric Skills Requirements

The College of Liberal Arts requires all entering undergraduate students to enroll in rhetoric coursework each semester until they achieve a satisfactory level of competence in oral and written communication; proficiency in investigating, analyzing, evaluating and responding to the ideas, beliefs and attitudes of other writers and speakers; and proficiency in the responsible use of various sources of information and ideas.

Students are originally assigned to Rhetoric courses on the basis of American College Test scores. Most entering freshmen are assigned either to 10:1-2, a two-semester, eight-credit sequence, or to 10:3, a one-semester, four-credit course.

Students initially assigned to and registered for 10:3, 10:4, or 36R:25 may attempt to satisfy all or part of the rhetoric requirement, and earn two or four semester hours of credit, by taking the writing and/or speech tests offered during the first week of the semester. Rhetoric classes begin with student performances which serve as placement indicators. Students in 10:1 who demonstrate above-average reading speed and comprehension and above-average writing skill may be advised to switch to 10:3, for example.

Students whose early work indicates a need for individualized instruction beyond their classwork may enroll for non-credit work in the Reading and/or Writing Labs offered by the Rhetoric Program. Some students may be advised to switch to 10:8, a one-semester, two-credit course of individualized instruction in reading, and/or to 10:9, a one-semester, two-credit course of individualized instruction in writing. No more than eight semester hours of rhetoric credit may be counted toward baccalaureate requirements.

(Transfer students may meet the rhetoric requirement with eight semester hours of transfer credit in comparable coursework, or with six semester hours of transfer credit in composition and two in speech. Students who partially satisfy the requirement with transfer credit may be assigned to 10:2-4 or 36R:25. Students admitted to the University with 40 or more transfer credits are excused from the rhetoric requirement.)

Admission Requirements

To qualify for admission to the College of Liberal Arts, the applicant must meet the College requirements outlined below, and any special requirements for the program of his or her choice.

Entering Freshmen

An applicant seeking admission as an entering freshman must have the high school from which he or she graduated provide a certificate of high school credits, including a complete statement of high school record, class rank, scores on standardized tests and certification of graduation. An applicant may be tentatively admitted after he or she has completed the junior year in high school, but admission will not be final until receipt of the final transcript and certification of high school graduation.

A graduate of an approved Iowa high school who has the proper subject-matter background, is in the upper one-half of his or her graduating class and meets specific curricular requirements, will generally be admitted upon certification of graduation. An applicant who is not in the upper one-half of his or her graduating class may be required to take special examinations, and, after a review of the entire record and at the discretion of the admissions officer, may be admitted unconditionally, admitted on probation, required to enroll for a trial period during a preceding summer session or denied admission.

A graduate of an accredited high school in another state will be expected to meet higher standards than the minimum requirements for a graduate of an Iowa high school. The options for admissions by probation or trial enrollment may not be open to these students.

A graduate of a nonapproved high school must submit all data required above, and must take examinations which demonstrate his or her general competence to do successful college work.

An applicant who is not a high school graduate must submit all data required above, take examinations to demonstrate general competence to do college work and provide evidence of specific competence for admission to a given curriculum.

Undergraduate Students Transferring from Other Colleges

Students from Accredited Colleges and Universities

Transcripts of records are given full value if they come from colleges or universities accredited by the North Central Association of Colleges and Secondary Schools or similar regional associations. The recommendations contained in the current issue of

the *Report of Credit Given by Educational Institutions* published by the American Association of Collegiate Registrars and Admissions Officers will be followed for schools not regionally accredited.

Each applicant must submit an official transcript bearing the original seal and signature of the official in charge of records from each college or university the student has previously attended. The applicant must also submit any other records or letters the College may require to support his or her application for admission.

A transfer applicant is expected to have maintained a C average (2.0 in a 4-point system) for all college work attempted and must not be under suspension from the last college attended. Transfer applicants who are not residents of Iowa are expected to have maintained a 2.25 average. An applicant who does not meet this standard may be permitted to take entrance examinations. An applicant who successfully completes the examinations may be admitted on probation.

In general, transfer applicants under academic suspension from the last college attended will not be considered for admission during the period of suspension or, if suspended for an indefinite period, will not be considered until six months have passed since the last date of attendance. When eligible for consideration the applicant will be considered on the basis of his or her performance on the entrance examinations.

A transfer applicant under disciplinary suspension will not be considered for admission until a clearance and a statement of the reason for suspension are filed from the previous college. When it becomes proper to consider an application from a student under suspension, the College must take into account the fact of the previous suspension. An applicant granted admission under these circumstances will in each case be admitted on probation, and his or her admission will be subject to cancellation.

Students from Nonaccredited Colleges

The College may refuse to recognize credit from a nonaccredited college or may admit the applicant on a provisional basis and provide a means for the validation of some or all of the credit. The validation period shall not be less than one semester and will ordinarily be a full academic year. The College will specify to the student the terms of the validation process at the time of provisional admission. Each student from a nonaccredited college is considered on his or her merits, and admission or rejection is at the discretion of the admissions officer.

Foreign Students

Foreign applicants (aliens who are or will be in the United States temporarily under provisions supervised by the U.S. Immigration Service for purposes of attending educational institutions), whether U.S. high school graduates or not, may be asked to meet higher standards for admission than the minimum requirements outlined for a resident graduate of an Iowa high school.

Applicants whose native or official language is not English must provide a score report from the Test of English as a Foreign Language (TOEFL) before admission may be granted. The Admissions Office may use other tests or criteria for judgment of proficiency for admission purposes. Students admitted with a TOEFL score of 550 or above will be considered proficient in English and held only to the same English requirements as other students. Students who score between 480-500 (TOEFL) are required to take an English proficiency evaluation by the University's Department of Linguistics prior to registration.

Freshmen evaluated as proficient must enroll in 10:1 or 10:3 Rhetoric. If not proficient, the student must enroll in appropriate English as a Foreign Language (EFL) courses. Thereafter, evaluation of the student's language competence must be made every semester prior to registration, and the student must continue to enroll in EFL courses until the student demonstrates proficiency or has earned a TOEFL score of 550 or more.

The Linguistics Department offers eight EFL courses (103:10 and 103:191-197).

Foreign students who have attended a U.S. college or foreign college or both before transferring to Iowa for undergraduate study may be expected to meet higher admission standards than the minimum requirements outlined for in-state transfer students. Foreign transfer students will have their proficiency in English evaluated in the same manner as entering freshmen. Those who are initially evaluated as proficient will fulfill the uniform undergraduate rhetoric requirements. If not proficient, enrollment in EFL courses is required until proficiency is demonstrated. Like foreign applicants, immigrants (permanent aliens) from typically non-English speaking backgrounds may be required to take the TOEFL, or other suitable measures of English proficiency).

Aerospace Military Studies

Department head: Lt. Col. George L. Jones III
Faculty: *professor* Lt. Col. George L. Jones III
assistant professors Capt. James P. Close, Capt. Roger A. Pace

The Air Force Reserve Officers Training Corps (AFROTC) at Iowa is designated as the Department of Aerospace Military Studies in the College of Liberal Arts. Credits earned in the Department may count toward any degree the University offers. A student may enroll in any academic course the Department offers, whether the student is a cadet or not.

To meet the challenges of complex, high-technology developments, the Air Force must have a professional officer corps with special abilities in a wide range of skills. Sophisticated aircraft manned by skilled pilots and navigators are still the most flexible weapons system in the Air Force. The Air Force also needs young officers to work with research and development, complex communications-electronics systems, high-speed computers, and in specialized fields like law and medicine.

The AFROTC program is designed to train officers with these capabilities. The first two years of the program at Iowa, and participation in summer field training, afford a no-obligation look at the Air Force. Entry into the last two years of the program is competitive, and entails a commitment to serve four years as an Air Force officer. Cadets entering flight training incur an additional three-year commitment.

Standard Program

The Air Force recognizes that the officer must be an imaginative leader and a resourceful manager. To insure that these traits are given an opportunity to develop, AFROTC has adopted an approach to learning which stresses student responsibility and involvement. In classes conducted in small seminars, cadets engage in group discussions, debates, problem-solving, and simulation activities requiring maximum individual participation and group cooperation. An essential part of this learning

process is the expectation that students will critically evaluate what they read and what they say. This student-oriented approach encourages inquiry, logical thinking, imagination and sound judgment.

The program is open to graduate as well as undergraduate students.

Course of Study

First Year

Fall

23A:11 The Air Force Today	1 s.h.
23A:96 Leadership Laboratory	0 s.h.

Spring

23A:12 The Air Force Today	1 s.h.
23A:97 Leadership Laboratory	0 s.h.

Second Year

Fall

23A:31 The Development of Air Power	1 s.h.
23A:96 Leadership Laboratory	0 s.h.

Spring

23A:32 The Development of Air Power	1 s.h.
23A:97 Leadership Laboratory	0 s.h.

Third Year

Fall

23A:114 Management and Leadership	3 s.h.
23A:96 Leadership Laboratory	0 s.h.

Spring

23A:115 Management and Leadership	3 s.h.
23A:97 Leadership Laboratory	0 s.h.

Fourth Year

Fall

23A:112 National Security Forces in Contemporary American Society	3 s.h.
23A:96 Leadership Laboratory	0 s.h.

Spring

23A:113 National Security Forces in Contemporary American Society	3 s.h.
23A:97 Leadership Laboratory	0 s.h.

Throughout the year, classroom instruction is supplemented by 3- and 4-day visits to Air Force bases, for orientation to Air Force life.

Two- and Three-Year Programs

Although the AFROTC curriculum normally spans four years, it can be completed in three years by compressing the first two years' courses into one year. The program also can be completed in two years if the student attends a six-week summer field training at an Air Force base before beginning the last two years of the regular curriculum. Students interested in the two-year program should contact the Department of Aerospace Studies early in the semester prior to attendance at field training.

Field Training

Prior to commissioning, all cadets must attend a field training session offered at Air Force bases across the country.

Field training for four-year cadets is four weeks in length and includes courses in cadet orientation, survival training, aircraft orientation, physical training, Air Force organization and function, career orientation, small arms familiarization, and human relations.

Two-week periods on active duty working in the student's future career area or attendance at the airborne "jump" school are voluntary options also available to selected students.

Advanced Placement

Service veterans can get full credit toward commissioning (not graduation) for the first two years of AFROTC.

Flight Instruction Program

During the year prior to commissioning, students qualified for pilot training will receive 25 hours of flying training from the Iowa City Flying Service.

Financial Assistance

Scholarships which provide tuition, books, laboratory fees, and a $100 per month tax-free subsistence allowance are available to cadets. Applications for four-year scholarships are submitted directly to National AFROTC Headquarters. Applications for 3 1/2-, 3-, 2 1/2- and 2-year scholarships are submitted through the Department of Aerospace Studies at the University.

All cadets in the last two years of AFROTC receive $100 monthly as a tax-free subsistence allowance. Students attending field training are paid while there and receive travel expenses. Uniforms and books for classes taught by military faculty are furnished and a $300 uniform allowance is provided for commissionees.

Educational Delay

Cadets may request an educational delay to postpone entry to active duty until after completion of an advanced degree or professional school.

Special Activities

The Department of Aerospace Studies sponsors several activities which contribute to cadet and University life.

The Arnold Air Society is a national professional honor society which engages in University and community service activities.

The Cadet Corps sponsors social activities throughout the year, including informal parties, a formal dinner, a military ball, and an awards ceremony which honors outstanding cadets for their accomplishments.

Courses

23A:11 The Air Force Today **1 s.h.**
Introduction to all facets of Air Force life; includes organization, mission, and growth of the Air Force, modern use of offensive and defense forces, employment of special purpose forces.

23A:12 The Air Force Today **1 s.h.**
Continuation of 23A:11.

23A:31 The Development of Air Power **1 s.h.**
Traces development of air power from Civil War balloons to Vietnam; includes development of air power doctrine, influence of technology, uses of air power in military and humanitarian operations.

23A:32 The Development of Air Power **1 s.h.**
Continuation of 23A:31.

23A:50 Aerospace Military Studies Flight Instruction **3 s.h.**
Prepares students to pass FAA private pilot's written exam; includes FAA regulations; flight computer; navigation; meteorology.

23A:96 Leadership Laboratory **0 s.h.**
Opportunity for cadets to experiment with and develop skills, techniques and attitudes in leadership and management; largely cadet-planned and directed; provides cadets with meaningful experiences with increasing authority and responsibility. May be repeated.

23A:97 Leadership Laboratory **0 s.h.**
Continuation of 23A:96. May be repeated.

23A:112 National Security Forces in Contemporary American Society **3 s.h.**
Critical analysis of the role of the armed forces as an integral element of contemporary American society; examines civil-military relations; U.S. defense policy; international environment; military justice.

23A:113 National Security Forces in Contemporary American Society **3 s.h.**
Continuation of 23A:112.

23A:114 Management and Leadership **3 s.h.**
Theory and application of basic management concepts, with emphasis on relation to Air Force leadership; includes knowledge base of communications, human behavior, management processes; also includes managerial strategy and tactics, value conflicts, managing forces in change.

23A:115 Management and Leadership **3 s.h.**
Continuation of 23A:114.

Afro-American Studies

Program chair: Darwin T. Turner
Faculty: *professor* Darwin T. Turner (English, Afro-American Studies)
assistant professor Fredrick Woodard (English, Afro-American Studies)
instructors Alfrieta Parks (Anthropology, Afro-American Studies), Jonathan Walton (History, Afro-American Studies)
lecturer Peter Nazareth

Because the Afro-American Studies Program is interdisciplinary, it also draws cooperating faculty from various departments, including American Studies, Anthropology, English, French, Geography, History, Political Science, Spanish, and Sociology.
Degree offered: M.A.; also cognate concentrations leading to B.A., M.A., and Ph.D. in American Studies

The Afro-American Studies Program focuses on the study of people of African ancestry in the North American colonies and the United States of America from the 17th century to the present. To provide a comprehensive view of that subject, the Program also offers courses examining the African heritage and the present relationships of African-Americans to Africans in other lands. Because a thorough understanding of Afro-American culture cannot be achieved through a study restricted to the perspective of a single discipline, all students in the program are required to pursue courses in both humanities and social sciences. Although the Program presently emphasizes history and literature, the Afro-American Studies Committee engages in a continuous effort to expand the perspectives by developing courses which will fuse the knowledge drawn from many disciplines in the humanities and social sciences.

The Program originated in 1969 in courses intended to foster awareness of the role Afro-Americans have taken in the development of the United States and to promote understanding of the present conditions and concerns of black Americans. Subsequently, these courses have been organized into a curriculum including a program leading to the Master of Arts degree in Afro-American studies, and concentrations of Afro-American Studies in programs leading to a B.A., M.A. or Ph.D. in American Studies. It is also possible for students seeking Ph.D. degrees in English or history to organize courses in Afro-American literature or Afro-American history into a special field or cognate area.

Although most of the students in the Ph.D. program are preparing to work in colleges and universities as teachers and administrators, the B.A. and M.A. programs provide valuable backgrounds for many other students seeking careers in community work, public school teaching, religion, government and political science. In short, the Afro-American Studies Program offers training important to any individual whose career will require understanding and knowledge of black Americans.

Undergraduate Study

Although there is not a degree program in Afro-American Studies at the undergraduate level, students interested in the field may wish to offer a concentration of Afro-American Studies courses within a program leading to a B.A. in American Studies. Undergraduates following such a program would be expected to take the following courses in Afro-American culture: 45:8, 45:60, 45:61; and five electives in Afro-American Studies from courses numbered between 45:10 and 45:187. Students are encouraged to take 45:116, 45:117 and 45:165, 45:166 as prerequisites to more advanced courses in Afro-American literature and history.

Graduate Programs

The Master of Arts Program

The interdisciplinary curriculum leading to a Master of Arts degree in Afro-American Studies has been designed particularly for individuals desiring an intensive, organized, graduate-level examination of Afro-American culture and experience. Such a program especially benefits individuals preparing to teach in community colleges, to work with community-service organizations, or to involve themselves in careers for which an understanding of Afro-Americans may be significant.

Curriculum Requirements

The Master of Arts program in Afro-American studies comprises 34 post-baccalaureate semester hours, normally completed in three semesters. Requirements include 45:211, 45:312, and 12 semester hours of elective courses in Afro-American Studies.

Most students will be required to earn six semester hours in literature/history by taking 45:116-117 Afro American Literature I-II or 45:165-166 Afro-American History 1600-1865, 1865 to Present. Students who have earned undergraduate or graduate credit for a year-long survey of Afro-American literature of Afro-American history will satisfy the literature/history requirement by studying that area for which they have no undergraduate credit. Students who have earned neither undergraduate nor graduate credit in Afro-American literature and Afro-American history may be required to complete both 45:116-117 and 45:165-166 with only six hours of credit allowed toward the M.A. degree. A student who has completed year-long, undergraduate or graduate surveys in both Afro-American literature and Afro-American history will be permitted to satisfy the literature/history requirement by selecting six hours of Afro-American Studies electives approved by the student's adviser.

Because the Afro-American Studies steering committee wishes to encourage doctoral study for those who have the ability, the interest, and the resources, it recommends that the other nine semester hours required in the Master of Arts Program be used to explore doctoral education in disciplines outside of Afro-American Studies. Among possible fields of study are American studies, anthropology, education, English, geography, history, and sociology. Students are encouraged to select at least one-half of the courses in their curriculum from those numbered above 200.

Language/Tool Requirements

No foreign language or tool is required for the Master of Arts Program in Afro-American Studies, but individuals deliberating the possibility of doctoral study in another field will be encouraged to attempt to complete one tool/language requirement for that field while studying on the master's level.

Comprehensive Examinations

Each student will be required to pass a written comprehensive examination in Afro-American Studies. The comprehensive examination will be prepared and evaluated by a committee of faculty members who teach courses in the Afro-American Studies Program. A component of the comprehensive examination will be based on a reading list in Afro-American studies prepared and approved by the Afro-American Studies steering committee.

Thesis/Project Requirements

A thesis is not required for a Master of Arts degree in Afro-American Studies.

If a student elects to write a thesis, the thesis must explore a topic of Afro-American culture and/or experience and must utilize research from more than one discipline. The maximum credit for such a thesis is four semester hours, and election of a thesis eliminates the requirement of 45:212.

A student who does not elect to prepare a thesis is required to develop, in consultation with an adviser, a project related to Afro-American culture and/or experience. When completed, this project must be presented to and defended before an appropriate class in Afro-American Studies.

Admission Requirements

In addition to the general requirements of the Graduate College, unconditional graduate admission in Afro-American Studies requires an appropriate educational background in literature and the social sciences, at least six hours of collegiate credit in courses in Afro-American literature and/or history, and a minimum grade-point average of 2.7 in previous collegiate courses in Afro-American studies. A student may be asked to take, without credit towards the master's degree, courses needed to remedy any deficiencies in undergraduate preparation.

An applicant for admission will be expected to provide three letters of recommendation from former professors, and a sample of his or her scholarly written work.

Recommendations for admission will be made by the admissions subcommittee of the Afro-American Studies steering committee.

Afro-American Studies Concentration within an M.A. Program in American Studies

Generally, a student seeking a concentration in Afro-American Studies within a Master of Arts program in American Studies will be an individual who is preparing for a career as a research scholar or a college/university teacher, and proposes to undertake doctoral study in American Studies. Of the 36 post-baccalaureate semester hours required for the degree, 12 to 24 normally are taken in Afro-American Studies. Since the Afro-American Studies program is interdisciplinary, students taking 24 hours are required to complete 45:211, and are encouraged to complete 45:116-117 and 45:165-166, except when equivalent courses have been taken on the undergraduate level.

For other requirements, see the program for a Master of Arts in American Studies described elsewhere in this *Catalog*.

Afro-American Studies Concentration within a Ph.D. Program in American Studies

Generally, a student seeking a Ph.D. in American Studies with a concentration in Afro-American Studies is preparing to be a teacher or research scholar on the college or university level. Of the 72 post-baccalaureate semester hours minimally required for the degree, at least 30 semester hours (not including the thesis) must be in courses in Afro-American Studies, including 45:211. 45:116-117 and 45:165-166 also are required, except when the student has completed equivalent year-long surveys in Afro-American literature and history before enrolling in the graduate program at The University of Iowa.

The interdisciplinary concentration in Afro-American humanities and social sciences requires students to explore both areas. The thesis (dissertation) must not only draw upon research from more than one field, but must also be focused on an aspect of Afro-American culture or experience.

Other Requirements

For additional requirements, please see the description of the requirements for the doctoral program in American Studies in the appropriate section of this *Catalog*.

Cognate Areas or Special Fields

It is possible for students to take concentrations of Afro-American courses as cognate areas or special fields in Ph.D. programs in history, English, and other disciplines. For further details, consult with an adviser in Afro-American Studies.

Co-Curricular Activities Related to Afro-American Studies

Black Kaleidoscope

Each year the Afro-American Studies Program attempts to promote knowledge and consciousness within the on-campus and off-campus community by sponsoring Black Kaleidoscope, a series of lectures and demonstrations by scholars and artists distinguished in Afro-American culture.

Institute in Afro-American Culture

Since 1968 The University of Iowa each summer has served as host for an Institute in Afro-American Studies for college and university teachers. The institutes, which bring renowned artists and lecturers to the campus, have focused on such topics as the Harlem Renaissance, Richard Wright, W.E.B. DuBois, black Americans in theater, and slave narratives. Although students in residence at the University are not eligible to be official members of the Institute, they are permitted to enroll in a 3 s.h. course which is offered at the same time as the Institute and on the current year's topic.

Black Action Theater

A co-curricular activity which is academically sponsored through the Afro-American

Studies Program. Black Action Theater affords participants an opportunity for instruction and experience in theatrical productions of plays by black authors.

Afro-American Cultural Center

The Afro-American Studies Program encourages participation in the facilities of the Afro-American Cultural Center. The Center serves as as museum and library for educational and cultural artifacts and exhibits of black culture. Thus, it provides cultural enrichment for black people of the Iowa City community and a cultural meeting place for black students. It also attempts to promote a knowledge of black culture which will improve interracial understanding among all members of the University community.

Black Genesis Troupe

The Afro-American Studies Program also encourages participation in Black Genesis Troupe, a student organization which blends dance, music, poetry, and visual arts in representations of black culture and history.

Courses

Afro-American Studies and Related Areas

45:8 Literatures of the African Peoples **4 s.h.**
An introduction to selected works of 20th-century black writers of the United States, the Caribbean, and Africa. Open to undergraduates only. Same as 11:14.

45:10 Black Poetry Workshop **3 s.h.**
A survey of black American poetry, from its roots in folk seculars and spirituals to the Black Arts Movement of the 1960s. Discussion and criticism of poems submitted by students in the class. Open to undergraduates only.

45:11 Contemporary Black Experience **3 s.h.**
Review and discussion of several versions or images of the contemporary black experience. The framework of the class will be lectures and discussion, with bibliography materials provided on request. Open to undergraduates only.

45:80 Introduction to Afro-American Society **3 s.h.**
General works in anthropology, sociology, and history provide the framework for an introduction to the social and cultural history of Afro-Americans. Same as 16:80.

45:81 Introduction to Afro-American Culture **3 s.h.**
Introduction to the culture of blacks in the United States, with emphasis on significant characteristics of their music, art, literature, and philosophy. Open to undergraduates only.

45:103 African Drama **3 s.h.**
An examination of dramas by contemporary Africans. The reading list includes plays for staging, one-act plays, radio plays. Open to advanced undergraduates and graduate students.

45:104 Afro-American Art **3 s.h.**
A study of the work of Afro-American painters and sculptors with attention to individual artists, movements, and African backgrounds.

45:108 Black Literature of Portuguese Expression **3 s.h.**
Same as 38:108, 108:109.

45:113 Africans in the New World **3 s.h.**
A social and cultural history of black populations in the New World. Area and topic emphasis will depend on the instructor. Open to advanced undergraduates and graduate students. Same as 106:113, 113:113.

45:114 Race and Ethnic Relations **3 s.h.**
A multi-disciplinary study of inter-group relations. Special emphasis given to social, historical, and political issues in the study of American minority groups. Open to advanced undergraduates and graduate students.

45:115 Brazil: People and Culture **3 s.h.**
Same as 38:115.

45:116 Afro-American Literature I **3 s.h.**
A study of Afro-American writers from the 18th century to 1930. The works will be examined in relation to cultural, social, and historical influences. Open to upper-level undergraduates and graduate students. Same as 8:116.

45:117 Afro-American Literature II **3 s.h.**
A study of literary developments among Afro-Americans from 1935 to the present. The writers and works will be studied in relation to the cultural, political, social, and literary influences upon Afro-Americans during the middle of the 20th century. Open to upper-level undergraduates and graduate students. Same as 8:117.

45:119 African Literature **3 s.h.**
A study of the portrayal in fiction of contemporary African states to illuminate both the vast body of "African" literature and contemporary Africa. Open to upper-level undergraduates and graduate students. Same as 8:119, 108:119.

45:120 20th Century Afro-American Fiction **3 s.h.**
An overview of themes, images, and styles in literature by Afro-Americans in the 20th century. Attention is also given to images of blacks in fiction by nonblack writers. Open to upper-level undergraduates and graduate students.

45:121 Readings in Afro-American Culture **3 s.h.**
Selected readings of significant books in Afro-American culture. May be taken as independent study by advanced undergraduates and graduate students who have completed basic studies of Afro-American culture.

45:124 Black Culture and Experience **3 s.h.**
An advanced examination of black culture and experience both nationally and internationally as revealed through the humanities and the social sciences. Primarily for graduate students.

45:128 The Black Woman in America **3 s.h.**
A study of the history of black women in American society, with particular attention to the relationship between stereotypic images and actual roles.

45:130 History of Black Music **3 s.h.**
A general survey of the history of black music in America from the 17th century to the present, with major emphasis placed on significant forms, styles and contributors and the sociological settings for such. Open to upper-level undergraduates and graduate students. Same as 25:106.

45:135 Introduction to the French-Speaking World **3 s.h.**
African and Caribbean literature written in French. Taught in French. Same as 9:163, 108:184.

45:136 The Inner City **3 s.h.**
A study of residential segregation of minority groups, spatial structure of "ghetto" areas, environmental quality of inner city neighborhoods, spatial aspect of problems of economic and social stress. Open to upper-level undergraduates and graduate students. Same as 44:136.

45:151 Race, Ethnicity and International Relations **3 s.h.**
Examination of racial and ethnic conflict, particularly in situations which threaten regional and world balances, and of world efforts to alleviate these situations. Same as 113:181.

45:155 Psychological Aspects of Black Behavior and Personality **3 s.h.**
Same as 7C:155.

45:162 African Development **3 s.h.**
A study of the problems of economic, political and spatial integration in Africa; patterns and processes of economic development and nation-building. Open to upper-level undergraduates and graduate students. Same as 30:146, 44:161.

45:163 History of Pre-Colonial Africa **3 s.h.**
A survey of the rise, decline and fall of African kingdoms before European colonialism. Discusses political, social and cultural institutions of these kingdoms. Open to advanced undergraduates and graduate students.

45:164 History of Colonial Africa **3 s.h.**
A survey of the history of colonial Africa from the partition by the European powers in the last two decades of the 19th century to independence in 1960. Open to advanced undergraduates and graduate students. Same as 16:160.

45:165 Afro-American History 1600-1865 **3 s.h.**
Historical survey of Afro-Americans that focuses on several topics: West Africa and the transatlantic slave trade; blacks in colonial America; slaves and free blacks; and blacks during the Civil War period. Same as 16:165.

45:166 Afro-American History 1865-Present **3 s.h.**
Historical survey of Afro-Americans that focuses on several topics; Reconstruction; evolution of Jim Crowism, World Wars I and II; and civil rights protests of the 1950's and 1960;s. Same as 16:166.

45:167 Studies in the Fiction of Afro-Americans **3 s.h.**
In-depth study of selected Afro-American novelists. The reading list for a particular term is determined by the instructor. Prerequisite: at least one semester of a survey of Afro-American literature or 45:120 or the equivalent.

45:169 Readings: African Culture **3 s.h.**
Open to advanced undergraduates and graduate students.

45:170 Modern African History **3 s.h.**
Same as 16:170.

45:175 Black Action Theater **3 s.h.**
A theory-performance course in black theater. In addition to studying theory related to stage presentations by black Americans, students assume individual responsibilities for productions by Black Action Theater. Primarily for undergraduates.

45:176 Black Action Theater **3 s.h.**
A theory-performance course in black theater. Plays selected are different from those examined and produced in 45:175. Primarily for undergraduates.

45:177 Studies in the Poetry of Afro-Americans **3 s.h.**
A study of selected poets or poetic themes in Afro-American literature. The reading list for a particular term is determined by the instructor. Prerequisite: one semester of Afro-American literature. Open to upper-level undergraduates and graduate students. Same as 8:153.

45:180 Afro-American Drama **3 s.h.**
A study of developments in dramas by Afro-Americans since 1923. Open to upper-level undergraduates and graduate students. Same as 8:154, 36T:186.

45:182 Modern African Novel 3 s.h.
Same as 106:120.

45:185 Topical Issues in Afro-American History 3 s.h.
An examination of particular topics in the history of Afro-Americans. Open to advanced undergraduates or graduates. Same as 16:105.

45:187 Black Man in American Drama and Theater, 1767-1945 3 s.h.
A history of blacks as images, performers, creative artists in American theater. Open to advanced undergraduates and graduate students.

45:210 Readings in the Culture of Black America 3 s.h.
An overview of the social, economic, political and religious experiences which have influenced the black American. Primarily for graduate students.

45:211 Introduction to Research in Afro-American Culture arr.
An introduction to research methods and bibliographies significant to the study of Afro-American culture. Required of graduate students concentrating in Afro-American Studies. Primarily for graduate students.

45:212 Advanced Readings in Black Culture arr.
A seminar focusing on textual, social and political analyses of black authors. The reading list for a particular term is dictated by the instructor. Primarily for graduate students. Same as 8:312, 48:312.

45:215 Politics and the Black Writer 3 s.h.
An attempt to explore the role values play in the formation of political ideology among selected black writers. The list of writers is determined by the instructor for a particular term. Primarily for graduate students.

45:220 Religion and Black Culture 3 s.h.
A study of the interrelationships of black culture, religions and philosophy in various sections of the world. Primarily for graduate students. Same as 32:235.

45:227 Three African Writers 3 s.h.

45:285 Seminar: Afro-American History arr.
Advanced study in Afro-American history with emphasis on selected topics. Primarily for graduate students. Same as 16:285.

45:286 Readings in Afro-American History arr.
Introduction to historiography, bibliography and methodology for the study of Afro-American history. Primarily for graduate students. Same as 16:286.

45:310 Sources for Study of Afro-American Literature 3 s.h.
Attention given to events, folk traditions, folklore, customs, myths, legends and individuals requisite to an understanding of allusions in Afro-American literaure. Primarily for graduate students.

45:312 Advanced Research in Afro-American Culture arr.
May be taught as seminar or as independent study for graduate students concentrating in Afro-American studies. Prerequisites: basic courses in Afro-American Studies and 45:211.

45:314 Seminar: Advanced Study in Afro-American Drama 3 s.h.
In-depth study of selected Afro-American playwrights or performers. Prerequisite: 45:180 or the equivalent. Primarily for graduate students.

45:340 Seminar: Advanced Study in Afro-American Poetry arr.

45:361 Human Rights and World Community arr.
A study of the nature of human rights, international obligations relating to them, problems of implementation. Primarily for graduate students. Same as 19:260, 30:365, 32:280.

45:465 Seminar: Literature and Other Disciplines arr.
Interdisciplinary study of major works of major figures in black culture. Primarily for graduate students. Same as 8:465.

Significant Courses Related to Afro-American Studies

For course descriptions, see appropriate sections of this *Catalog*.

Business Administration

6B:252 Employment Relations and Public Policy 3 s.h.

Economics

6E:137 Problems in Urban Economics 3 s.h.

Education

7F:104 Education in Newly Developing Countries 2-3 s.h.
7F:130 Educational Sociology 2-3 s.h.
7F:380 Seminar: Value Problems in the Administration of American Education 3 s.h.
7P:109 Socialization of the School-Age Child 2-3 s.h.
7U:133 The Culturally Different in Educational Settings 3 s.h.

History

16:61 American History, 1492-1877 3 s.h.
16:62 American History, 1877-Present 3 s.h.
16:163 United States in the Early Republic 3 s.h.
16:164 Civil War and Reconstruction 3 s.h.
16:165 The Gilded Age in America 3 s.h.
16:166 The Progressive Era in America 3 s.h.
16:167 The Contemporary United States 1920-1940 3 s.h.
16:168 The Contemporary United States 1940-Present 3 s.h.
16:169 The Revolutionary Generation in America 3 s.h.
16:179 American Thought and Civilization 1620-1865 3 s.h.
16:180 American Thought and Civilization 1865-Present 3 s.h.

American Studies Program

Program chair: Albert E. Stone
Faculty: *professors* Margaret B. McDowell (Women's Studies, Rhetoric), Albert E. Stone (American Studies, English), Darwin T. Turner (Afro-American Studies, English)
associate professor John Raeburn (American Studies, English)
assistant professors Richard P. Horwitz (American Studies), Jane A. Weiss (Women's Studies, Sociology), Fredrick Woodard (Afro-American Studies, English)
instructors Alfrieta V. Parks (Afro-American Studies, Anthropology), Jonathan W. Walton (Afro-American Studies, History)

American Studies draws additional cooperating faculty from Afro-American Studies, Anthropology, Art and Art History, Economics, Education, English, Geography, History, Journalism, Law, Linguistics, Music, Philosophy, Political Science, Psychology, Religion, Social Work, Sociology, Speech and Dramatic Art, Broadcasting and Film, Urban and Regional Planning, and Women's Studies.
Degrees offered: B.A., M.A., Ph.D.

The American Studies Program offers courses, degree programs, and joint programs which provide a broad introduction to American culture and society, past and present. Courses in American experience offered by cognate departments are combined with interdisciplinary courses and seminars within the program to explore aspects of life in the United States, including popular and high culture, institutions, social processes, values, artifacts, and the contributions of American subcultures. Research is carried on into significant problems whose solutions lead across traditional departmental lines and which may combine methodologies from different disciplines. The program's aim is to train cultural critics and scholars who are broadly familiar with the dynamics of cultural experience. Graduates are prepared to pursue careers in business, education, government, journalism, and the social services, and to carry on graduate or professional study in law, medicine, business, theology, as well as the humanities and social sciences.

Undergraduate Study

The undergraduate major in American Studies stresses broad training in cultural analysis and communication rather than strictly preprofessional education. The prospective major is invited to construct, with the assistance and approval of an adviser, an individual plan of study. This program should combine courses from the cooperating departments and programs with integrative courses in American Studies. As preparation for the major, many historical-cultural, literature, and social science courses are relevant; 11:9 American Lives is especially recommended.

The major program normally consists of 12 courses (36 s.h.) selected to meet the following guidelines:

Four courses (12 s.h.) in American or Afro-American Studies, including 45:1 and 45:90 and two additional courses from 45:2, 45:60, 45:61, 45:101, 45:102, 45:158, 45:183, 45:186, 45:198;
Two courses (6 s.h.) in American history, normally 16:51, 16:61, and/or 16:62; and
Six courses (18 s.h.) from cognate departments (and/or additional American Studies courses). In consultation with an adviser, the student should select appropriate courses which relate and explore a common period, topic, theme, or problem in American cultural experience.

Honors

Honors candidates in American Studies must elect 45:90 and 45:96. In the latter course, the student will, with the adviser's help, define and research an interdisciplinary topic and present the results in a senior essay.

The Master of Arts Program

The M.A. in American Studies may be either a terminal degree or preliminary to the Ph.D. in American Studies or in a traditional department.

A joint program exists with the College of Law which offers a broad cultural context for the study and practice of law and leads to the J.D. and M.A. degrees simultaneously. Similar joint programs may be arranged in other professional fields.

The M.A. program is designed to be completed in three semesters, and normally includes 12 courses (36 s.h.). These courses should be chosen to meet the following requirements:

Four American Studies courses or seminars, including 45:200, 45:201, and two additional courses;
Four courses in one field or aspect of American Studies, either in a traditional discipline or on a topic, period, or problem approached from several disciplinary or methodological perspectives;
Four courses in another field or aspect of American Studies; and
A comprehensive examination on coursework and basic concepts.

The Doctoral Program

The doctoral candidate in American Studies, in consultation with an adviser, arranges a coherent program of courses and seminars for a minimum of 72 s.h. beyond the B.A. Successful completion of these courses, the comprehensive examination and the writing of the doctoral thesis, together with demonstrated mastery of the requisite tools and skills, comprise the steps to this interdisciplinary degree in culture studies.

Candidates prepare themselves in five areas: American Studies seminars in interdisciplinary approaches and methods; substantial coursework in a major field or topic; equivalent work in a second major field or topic; courses in a minor field or topic; and tools, skills, or comparative culture study.

Though permitted considerable flexibility in planning a program, the American Studies candidate must meet certain basic requirements. One such requirement is that all students directly engage, in both coursework and reading, the cultural diversity of American life and experience. Therefore, some coursework in such areas as Afro-American Studies, Women's Studies, Native American culture, or Chicano culture is expected; this will be specifically explored on the candidate's oral exam. A second requirement is that each program will include substantial study of one period of American cultural history as defined to reflect the student's specific interests. The five general areas are as follows:

American Studies. The candidate will normally elect four or five courses or seminars in American Studies, including 45:200 and 45:201 in the first year. Of the remaining courses, 45:530 (a tutorial in independent reading and research leading to a course syllabus or publishable essay) is strongly recommended. Instead of a written exam in this area, the candidate will prepare a position paper or interdisciplinary essay.

First Major Field. Normally, six or seven courses (18-21 s.h.) will be selected in one field, area, or topic, including independent work in tutorials. The nature and scope of a major field will vary. For some, it will be a traditional disciplinary field such as American Social and Intellectual History, American Politics, or Afro-American Literature. For others, it may be a comparative study of institutions like the family or the contemporary city, or of thematic or period studies (e.g., women in American culture: 1620-1920, or contemporary popular culture).

After taking such a group of related courses, the student will compose a list of key texts, documents, or artifacts which focus the coursework and on which a four-hour written examination will be based.

Second Major Field. The student selects six or seven courses in another field, topic, or theme in American culture studies, complementary to the first field. If the first field is defined broadly or traditionally, the second might be more specific or thematic. If one field is predominantly artistic in content, the other might focus upon history or the social sciences. Parts of several courses may be combined to flesh out a special field, but overlapping claims for credit should be avoided.

Again, a four-hour written exam will be set on a list of books, documents, or artifacts from this area. This written exam, together with the position paper and the first-field written exam, will form the grounds for the final oral examination.

The Minor Field. This area will normally comprise three or four courses, or relevant portions of a larger number, organized around a specific topic or subdiscipline. Examples: Indian-White Cultural Relations, Concepts of an American Self, Technology and American Culture. A student who wishes to explore a larger field or discipline within the scope of the minor field may do so, provided one of the major fields has a thematic or specific focus.

Instead of a written exam, the student will prepare an annotated bibliography on the field which will be evaluated by a member of the comprehensive exam committee. A student who has already submitted an annotated bibliography for a course may opt for a two-hour written exam based on a suitably abbreviated reading list.

Tools, Thesis, Comparative Cultures, Etc. The final area of coursework in American Studies is a looser category for up to 12 semester hours, to be allocated as the student wishes among the following:

Up to 6 s.h. for graduate-level courses in foreign languages, film making, linguistics, computer science, statistics, etc.;

Up to 6 s.h. thesis research and writing, following completion of the comprehensive exam and other requirements;

Up to 6 s.h. for courses on other cultures, including European, African, or Latin American;

Up to 3 s.h. for such courses as Teaching American Studies, Teaching Social Studies, etc.; and/or up to 6 s.h. for single courses on American topics outside of the major and minor fields.

Tools and Skills

In addition to coursework, American Studies doctoral candidates must demonstrate mastery of certain tools and skills useful for culture studies. These are meant to complement fields of study, provide technical or theoretical perspectives, and facilitate research. Tools and skills include foreign languages, statistics and computer science, still or motion picture photography, linguistics, creative writing, and certain courses, such as psychoanalysis, communications, or political theory. Two tools or skills requirements must be satisfied for the Ph.D.; this may be done by coursework, prior experience, summer internships, or independent study.

Internships

Internships for qualified American Studies students can be arranged with the following institutions: State Historical Society of Iowa; Division of Historic Preservation; University of Iowa Museum of Art; Living History Farms; Herbert Hoover National Historic Site; Putnam Museum, Davenport. If research is carried out during such on-the-job training, academic credit can be granted, either for semester or summer projects.

Thesis

The final requirement for the Ph.D. is a satisfactory thesis on a topic the investigation of which involves more than one field or discipline. Creative theses (including fiction, autobiography, film, etc.) are allowed if combined with critical analysis of the cultural experiences reflected therein.

Courses

Primarily for Undergraduates

45:1 American Values **3 s.h.**
Introduction to American Studies via representative texts, artifacts, and cultural values in historical and contemporary perspective.

45:2 Issues in American Culture **3 s.h.**
Topics and problems in American Studies and Women's Studies. Recent courses have focused on such aspects of American experience as jazz, women and the family, political trials, Franco-American cultural relations, the TV situation comedy.

45:90 Senior Colloquium **3 s.h.**
Intensive investigation of a single theme or period in American culture, employing a variety of materials and an interdisciplinary perspective; topics include the 1930s, childhood and adolescence in America, the West in myth and reality.

45:96 Honors Project **arr.**
Independent research and writing on an interdisciplinary topic.

For Undergraduates and Graduates

45:101 Aging in America **3 s.h.**
Social, demographic, historical, and imaginative perspectives on the older American.

45:102 Readings in American Studies **arr.**

45:141 Literature and Culture of America Before 1800 **4-6 s.h.**
The formative period in American culture, studied through historical records, artifacts, and the arts; special attention to problems of spatial, political, and social order, and to the psychology of colonialism. Same as 8:141.

45:158 Visual Arts and American Culture **3 s.h.**
Painting, photography, film and television as cultural expressions of American life and thought.

45:160 American Society **3 s.h.**
Same as 34:160.

45:183 American Communities: The Coralville Strip **3 s.h.**
Interdisciplinary study of an American scene, via fieldwork, American Utopias.

45:186 Comparative Perspectives on American Culture **3 s.h.**
Aspects of American and non-American cultures examined in comparative context, e.g., foreign travelers in America, the frontier in Canada and the United States, technological innovation and adaptation in England and America. Same as 8:186.

45:198 Popular Culture **2-3 s.h.**
Examination of several types and varieties of American popular culture such as the detective novel, the Western, the Hollywood film, and the television drama. Emphasis on their relation to other features of American life.

Primarily for Graduates

45:200 Introduction to American Studies I **3 s.h.**
Theories, methods, and cases in American culture studies, with special attention to social science approaches.

45:201 Introduction to American Studies II **3 s.h.**
Approaches to literary and historical dimensions and interactions of American cultural and subcultural experience.

45:225 Psychoanalysis and Culture **3 s.h.**
Freudian and post-Freudian theories and analyses of culture and personality; literary, historical, and sociological problems in terms of individual and group psychology.

45:530 Special Project: Graduate **arr.**
Independent research and tutorial in advanced theories, methods, and problems in American culture, leading to a new course syllabus or publishable essay.

45:531 Seminar in American Studies Bibliography **3 s.h.**
Advanced study of culture theory and related problems and approaches.

45:590 M.A. Thesis **arr.**

45:595 Ph.D. Thesis **arr.**

45:600 Seminar: American Film and American Culture **arr.**
Intensive study of the artistic, social, and economic relationships between film and culture. Recent seminars have examined the decades of the 1920s and the 1930s. Same as 36B:600.

Anthropology

Department chair: Richard Shutler, Jr.
Faculty: *professors* June Helm, Richard Shutler, Jr.
associate professors Thomas Charlton, E. Paul Durrenberger, Mac Marshall, Marshall McKusick
assistant professors Nora England, Douglas Midgett, William Roseberry
instructor Alfrieta Parks
adjunct professor Alton K. Fisher
adjunct associate professor Duane C. Anderson
adjunct assistant professor Toni Trip Reimer (School of Nursing)
Degrees offered: B.A., M.A., Ph.D.

All human cultures, whether historical or contemporary, simple or complex, are part of anthropology's study. Anthropology provides a framework for understanding the place of humans in the natural world, their evolutionary background and development, the organization of social life, cultural and symbolical systems, the evolution of cultures and societies and the interrelations among society, personality and shared canons of thought and feeling.

Undergraduate Program

An undergraduate major in anthropology provides a solid foundation for careers not only in anthropology but also in a variety of fields involving work with persons from cultures and subcultures different from one's own, e.g., the health care professions, law, economics and business, political science and government, social work, international affairs, and education.

Majors must take at least 30 semester hours of coursework in anthropology, including 113:3 Introduction to the Study of Culture and Society, 113:10 The World's Peoples and 113:11 Introduction to Archaeology and Physical Anthropology. In addition, each student must take one course in archaeology, one course in ethnology and one course

in social anthropology. The remaining hours are to be selected in consultation with the adviser.

Anthropology electives offer a wide range of choices, including courses dealing with language and culture, social problems of underdeveloped areas, religious activity in folk and tribal settings, primitive art, biological anthropology and urban anthropology. Specialization is discouraged in the undergraduate program, which is designed to give the student the broadest possible cross-cultural background. Coursework is encouraged in such related areas as sociology, linguistics, geology, geography, history, psychology, zoology, and statistics. Students are also encouraged to participate in archaeological field research.

Special Programs

Honors

Designed for maximum development of superior abilities and interests, the Honors Program in Anthropology is open to students with a minimum cumulative grade-point average of 3.0 overall and 3.2 in anthropology. In addition to the regular requirements for a major in anthropology, Honors students must complete the Department's Honors Seminar and Honors Research courses.

Field Research

Opportunities are available for students to participate in archaeological field research either at a site near Mexico City or at various sites in Iowa. Under the direction of University archaeologists, they acquire on-the-job knowledge of archaeological techniques and methods of interpreting artifacts.

Graduate Programs

Although dedicated to the holistic view of anthropology, the Department's emphases lie in archaeology and social-cultural anthropology. The Department offers work leading to the degrees Master of Arts and Doctor of Philosophy in anthropology.

M.A. Program

The M.A. program is general in nature, designed to prepare the student to deal with any aspect of anthropology at an introductory level.

The Department offers the M.A. degree with or without thesis. The latter program is considered terminal, and precludes consideration for admission to the Ph.D. program.

The number of semester hours of credit required for the M.A. with thesis may vary from 30 to 38, depending upon the student's previous anthropological training. The nonthesis program requires at least 38 semester hours of graduate work. A 38-hour M.A. degree without thesis is available in conjunction with a minor concentration in museology.

The first-year graduate student entering the program with a B.A. degree in anthropology will, in coordination with an assigned faculty adviser, work out a program which will include those distribution requirements for which prior experience or competence can not be demonstrated on the basis of undergraduate courses taken. First-year students entering the program with a B.A. or M.A. degree in a field other than anthropology normally will be expected to take more courses in anthropology than those who majored in the field as undergraduates. In every case, however, the program will be tailored to the needs and background of the student.

The following distribution requirements exist at the M.A. level: (a) one of the following: 113:140 Social Anthropology, 113:240 Seminar: Social Anthropology, 113:146 History of Anthropology, 113:246 Seminar: History of Anthropology, 113:201 Seminar: Anthropological Theory; (b) one of the following: 113:171 Anthropological Linguistics, 113:172 Language and Culture; (c) 113:168 Archaeology Theory and Method, 113:268 Seminar: Archaeological Theory and Methods; (d) 113:185 Biological Anthropology, 113:285 Seminar: Biological Anthropology; (e) one course in social institutions; (f) one course in linguistics (including courses from the Department of Linguistics); (g) one course in archaeology. No more than nine semester hours of courses outside of anthropology and no more than three semester hours of Independent Study may be applied toward the M.A. degree requirements in anthropology.

Students with previous training in anthropology, whatever their undergraduate major, may petition for permission to waive any part of the above distribution requirements.

Anthropology/Museology Joint M.A. Program

In cooperation with the Museum of Natural History, the Department of Anthropology offers a program of study leading to the M.A. degree in Anthropology with a concentration in museology. Details of exhibit preparation and the general operational procedures of small science museums form part of the student's training. Further information on this option may be obtained by interested persons from the Department of Anthropology or the Museum of Natural History.

Ph.D. In Anthropology

The Ph.D. degree represents a balance between general competence in all the subfields of anthropology covered at the M.A. level, and a professional level of specialization in one. These are the requirements:

At least 72 semester hours of graduate coursework;
Demonstration of a reading knowledge of one foreign language;
Mastery of a relevant research skill (e.g., fluency in a foreign language or proficiency in a branch of mathematics, logic, computer programming, geology, or paleontology);
Ethnographic or archeological specialization in a major geographic area approved by the student's Ph.D. advisory committee (e.g., North America, Mesoamerica, Oceania, Southeast Asia or the circumpolar region);
Specialization in a major and minor topical area (e.g., kinship or social organization, ethnohistory, settlement pattern archaeology, language and culture, religion, cultural ecology, urban anthropology);
A written comprehensive examination in the student's areas of specialization; and
Preparation and oral defense of a dissertation.

The comprehensive examination ordinarily will be taken when the student's coursework is completed or nearly completed, after the research skills requirements have been satisfied, and before he or she begins fieldwork.

All doctoral candidates are required to carry out original anthropological research. Ordinarily, students conduct fieldwork as the basis for their dissertations; however, occasionally a research proposal may be carried out using only documents, collections or other source materials.

All doctoral candidates are required to be adequately trained in techniques of gathering primary data in archaeological or ethnographic field research.

Graduate Admission

Applicants for admission to the graduate program in anthropology will be considered regardless of the field of their previous training.

An applicant with an M.A. degree in another discipline must seek admission as a first-year graduate student. Admission to the Department's graduate program may be at either the M.A. or Ph.D. level; however, full admission to the Ph.D. program depends on successful completion of departmental requirements.

Applicants for admission to the graduate program must meet the general admission requirements of the Graduate College (see "Graduate College") and will be required to submit the following documentation: (1) a completed University application form; (2) transcripts of all previous undergraduate and graduate work; (3) three letters of recommendation from individuals competent to judge the candidate's potential for graduate training; (4) scores from the aptitude portion of the Graduate Record Examination; and (5) at least one typewritten example of their previous work (e.g., a term paper or an original experiment). Applicants with an M.A. degree from other universities are required to submit a copy of their master's theses; in cases where an M.A. has been granted without thesis or where the master's thesis is not yet complete, typewritten copies of three papers completed in graduate school should be submitted.

It is desirable that the applicant have a 3.0 grade-point average or better. However, applicants with lower grade-point averages may be admitted with conditional status if other criteria indicate potential for graduate work.

Minor in Anthropology

A graduate student from another department of the University may obtain a minor in anthropology. The number of credit hours and the selection of courses which constitute the minor should be determined in consultation with members of the faculty of the Department of Anthropology, and with appropriate members of the student's major department.

Special Facilities

The Department of Anthropology has access to the Iowa Archaeological Collections, and the University is a charter member of the Human Relations Area Files, an extensively annotated set of source materials on the peoples of the world—their environments, behavioral patterns, social lives and cultures. The HRA Files and other library resources give anthropology students access to source materials on more than 400 different cultures.

A field laboratory with extensive archaeological research data is maintained in Mexico.

Financial Assistance

A limited number of teaching and research assistantships are available. Application for an award should be made directly to the chair, Department of Anthropology.

Faculty Strengths

Members of the anthropology faculty have studied and lived in the Pacific islands, the Orient, the Caribbean, Mesoamerica, Latin America, and the Subarctic. During the past three years departmental faculty have conducted field research in Mexico, Guatemala, Venezuela, Mississippi, the Philippines, Micronesia, Thailand, the Canadian Subarctic, St. Lucia, and Iowa. Recent research by departmental faculty includes precontact trade networks and the role of hydraulic cultivation systems in the emergence of civilization in the Valley of Mexico, patterns of political and economic development of emerging countries, comparative ethnographic studies of hunting and gathering groups, archaeological investigations of Paleo-Indian sites in Iowa, alcohol use and abuse in Oceania, agricultural and economic decision making among rural peoples in northern Thailand, archaeological excavations in Micronesia and the Philippines, and Mayan linguistics in Guatemala.

Courses

For Undergraduates Only

113:3 Introduction to the Study of Culture and Society 4 s.h.
Comparative study of culture and social organization; may be taken in partial fulfillment of social science core requirement.

113:10 The World's Peoples 3-4 s.h.
Anthropological studies of community life around the world; systems of belief and action by which different peoples live; anthropological literature and ethnographic films on Americas, Africa, Eurasia and Oceania; may be taken in partial fulfillment of social science core requirement.

113:11 Introduction to Archaeology and Physical Anthropology 3-4 s.h.
Origins and development of man and society from the vantage point of archaeological excavations; introduction to man's physical evolution and culture history.

113:14 Language and Man 3 s.h.
Language and human communication in cultural context; animal communication in relationship to the origin and development of language; nonverbal communication.

113:20 Introduction to Midwestern Prehistory: Emphasis Iowa 3 s.h.
Prehistoric cultural sequence of Iowa viewed against the background of North American prehistory. Discussion of current and future research. No prerequisites. Not open to anthropology majors.

113:75 Individual Study 1-3 s.h.
Supervised reading in some special area or subdivision of anthropology in which student has had basic course.

113:90 Honors Seminar: Anthropology 2 s.h.
For undergraduate majors with superior academic records; selected theoretical and methodological issues. Prerequisites: senior standing and consent of instructor.

113:97 Honors Research 2-4 s.h.
Honors candidate undertakes a special research project, under Honors chair, chosen after consultation with the Honors adviser; may be repeated.

Advanced Courses

General Anthropology

113:60 Japan: the Living Tradition 2-3 s.h.
Same as 39J:60.

113:101 General Anthropology 3 s.h.
Human evolution, prehistory, and race; the major institutions and arts of humans as evidenced in nonliterate societies; primarily for nonmajors with advanced standing; not open to students who have taken 113:3.

113:107 Anthropological Perspectives on Mental Health 3 s.h.
Prerequisites: 113:3 or 113:101, junior standing or consent of instructor. Same as 96:174.

113:108 Health and Cultural Diversity 3 s.h.
Prerequisites: 113:3 or 113:101, junior standing or consent of instructor. Same as 96:172.

113:109 Literature and Anthropology 3 s.h.
Same as 108:157, 8:151, 48:151.

113:146 History of Anthropology 2-3 s.h.
Development of anthropology as discipline, comprehending persons, concepts, problems and theories, stressing cultural anthropology. Prerequisite: 113:3, 113:101 or consent of instructor.

113:147 Comparing Cultures 2-3 s.h.
Problems and concepts involved in comparing and contrasting behavior and ideas of different cultures; for advanced students; content varies according to special interests of instructor; may be taken a maximum of three times with consent of instructor.

113:148 Comparing Cultures 2-3 s.h.
Same description as for 113:147.

113:149 Comparing Cultures 2-3 s.h.
Same description as for 113:147.

113:150 Culture and Personality 3 s.h.
Relationship of sociocultural and psychological variables in understanding behavior; cross-cultural differences and regularities in personality and socialization. Prerequisite: 113:3, 113:101 or 34:1.

113:156 Women's Roles: A Cross-Cultural Perspective 3 s.h.
Social, economic, and political roles of women around the world; an analysis of sex roles, with emphasis on culture change and implications for the lives of women in various societies.

113:159 Primitive Art 3 s.h.
Theories and interpretations of primitive art concentrating on the aboriginal art of the New World; materials related to current problems in interpretation in archaeology and ethnology.

113:180 History of Iowa Archaeology 3 s.h.
Origin and growth of archaeology in Iowa as it relates to the developing discipline in North America. Not open to anthropology majors. Prerequisite: 113:20 or a course in North American prehistory.

113:181 Race, Ethnicity and International Relations 3 s.h.
The examination of racial and ethnic conflict, particularly in situations which threaten regional and world balances and of the efforts to alleviate these situations. Same as 45:151.

113:182 Iowa Prehistory 3 s.h.
An intensive review of the various archaeological cultures in Iowa from the earliest preceramic remains to the ethnohistoric period. Does not satisfy archaeological course requirement for anthropology majors. Prerequisite: 113:11 or 113:20.

113:183 Independent Study arr.
Prerequisite: consent of instructor.

113:193 Asia: Half the World 3 s.h.
Same as 39:193, 108:147.

113:194 Asia: Half the World 3 s.h.
Same as 39:194, 108:148.

113:201 Seminar: Anthropological Theory 3 s.h.
An examination of contemporary theoretical issues in social and cultural anthropology.

113:203 Advanced Survey of Anthropology 2-3 s.h.
Selected aspects of anthropological theory: problems, concepts, and representative thinkers as seen in the contexts of Western intellectural history and of anthropology as a social organization of practitioners. Seniors and graduate students.

113:204 Methods and Procedures in Anthropological Data Analysis 3 s.h.
Procedures for analyzing field data and library materials including HRA Files.

113:246 Seminar: History of Anthropology 2-3 s.h.
Development of anthropology as a discipline, comprehending persons, concepts, problems and theories in archaeology, biological and cultural anthropology. Alternate years. Prerequisite: graduate standing or consent of instructor.

Ethnology

113:110 The American Indian 3 s.h.
History and culture; emphasis on North America. Prerequisite: 113:3 or 113:101.

113:113 Africans in the New World 3 s.h.
Social and cultural history of black populations in the New World; areal and topical emphasis will depend upon instructor. Same as 108:113, 45:113.

113:116 Ethnology of Mesoamerica 3 s.h.
Indigenous peoples of Middle America; sociocultural data; bands, tribes, and empires will be considered from the time of earliest contact up to their point of extinction or present condition. Prerequisite: 113:3 or 113:101.

113:125 Ethnology of Japan 3 s.h.
Description and analysis of the origins and development of Japanese culture from prehistoric times until the present, with emphasis on modern Japanese society. Same as 39J:125.

113:127 Ethnology of Oceania 3 s.h.
Comparative ethnography of island Oceania (Polynesia, Micronesia, Melanesia); postcontact and current history of the Pacific area, special problems of living in island habitats, contributions of Oceanic ethnography to anthropological theory and an examination of contemporary problems and research trends. Prerequisite: 113:3 or 113:101.

113:129 Ethnology of Southeast Asia 3 s.h.
Historical backgrounds and ethnology of mainland Southeast Asia exclusive of Vietnam; ethnic identity, ecology, forms of political organization and the relation of these to other social factors. Prerequisite: 113:3 or 113:101 or consent of instructor. Same as 39:129.

113:130 China and Japan: Comparing Cultures 3 s.h.
The description, analysis and comparison of the origins and development of Japanese and Chinese society from prehistoric times until the present. Alternate years. Same as 39:130.

113:131 Latin American Economy and Society 3 s.h.
Aspects of the development and present structure of Latin American economy and society, with emphasis on rural regions in the context of national development, general focus on area as a whole.

113:165 The Greater Southwest Archaeology 3 s.h.
Ethnology and archaeology of native cultures in the area northwest of Mesoamerica; emphasis on ecological approach, attempt to demonstrate probable routes of diffusion and migration from Mesoamerica to the Southwest. Alternate years. Prerequisite: 113:3 or 113:101.

113:241 Process and Problem Development: Latin America 1-3 s.h.

113:247 Ethnological Research Seminar arr.
Coordinated research on culture-areal and/or topical problems in ethnology; content varies according to the special interests of the instructor; may be taken a maximum of three times. Prerequisite: consent of instructor.

Social Institutions

113:118 Social Anthropology of the Caribbean 3 s.h.
Historical background and other factors lying behind contemporary social and cultural situations in the insular and circum-Caribbean region. Emphasis on Afro-American population and cultural components. Prerequisite: 113:3, 113:101 or consent of instructor.

113:119 Urban Anthropology 3 s.h.
The development and role of the city in preindustrial society; processes of urbanization with particular attention to the behavior of individuals and small groups in urban environments; areal emphasis will depend upon instructor.

113:140 Social Anthropology 2-3 s.h.
Processes of culture and social phenomena as known through comparative study of nonliterate societies and cultures. Prerequisite: 113:3 or 113:101.

113:141 Economic Anthropology 3 s.h.
Study of social relations of production, circulation, and consumption in noncapitalist societies; examination of issues in underdevelopment. Prerequisites: 113:3 or 113:101, graduate standing or consent of instructor.

113:142 Anthropology of Religion 2-3 s.h.
Religious activity in folk and tribal settings; focus upon religious thought, myth, ritual and symbol systems, and upon the application of theories of the origin and functions of religion in human affairs. Prerequisite: 113:3, 113:101 or consent of instructor. Same as 32:157.

113:144 Political Anthropology 3 s.h.
Political behavior in tribal, folk, and complex societies; origin and development of the state; investigation of non-Western procedures in conflict resolution and social control. Prerequisite: 113:3 or 113:101 or consent of instructor.

113:152 Cognitive Anthropology 3 s.h.
Processes, products and capacities for knowledge and the application and development of ideas about cognition in anthropological contexts; understanding cultural similarities and differences. Prerequisite: 113:3, 113:101 or consent of instructor.

113:153 Introduction to the Study of Kinship 3 s.h.
Introduces fundamental concepts and definitions in kinship studies; historical overview of the field; focuses intensively on several major kinship theorists; concludes with an examination of contemporary approaches. Prerequisite: 113:3 or 113:101.

113:155 Race and Ethnic Relations 3 s.h.
Multidisciplinary study of intergroup relations; special emphasis given to historical, sociological and political issues in study of American minority groups. Prerequisite: 113:3 or 34:1. Same as 34:155.

113:157 Alcohol and Culture 3 s.h.
Use and abuse of alcoholic beverages cross-culturally, focusing on common patterns of drinking and social variability in drunken comportment, implications of study of drinking in other cultures, of drinking behaviors in American society. Alternate years. Prerequisite: 113:3, 113:101 or consent of instructor.

113:158 American Kinship 3 s.h.
Anthropological analysis of American kinship and family structure in contemporary United States. Special problems in the study of kinship are elucidated through an examination of the American kinship system. Alternate years. Prerequisite: 113:3, 113:101 or consent of instructor.

113:160 Social Anthropology of Peasantry 3 s.h.
Study of the social systems of peasant and rural proletarian societies. Prerequisite: 113:3 or 113:101.

113:209 Seminar: Complex Societies 3 s.h.

113:210 Seminar: Kinship 3 s.h.
Historical survey of position of kinship studies in anthropology, with emphasis on theoretical issues and contributions by people such as Morgan, Murdock, Fortes, Levi-Strauss, Goodenough, and Schneider.

113:240 Seminar: Social Anthropology arr.

113:275 Urban Growth in Developing Countries 3 s.h.
Same as 44:275, 42:275, 6E:275, 102:275, 34:275.

Archaeology

113:111 Indians of the Woodlands and Plains 3 s.h.
Prehistoric and historic Indians of the Middle West region of North America; ecological adjustments, subsistence base and technological developments of the various groups. Prerequisite: 113:3, 113:101 or 113:11.

113:161 New World Archaeology 3 s.h.
Physical and cultural history of Eskimo and Indian populations of New World as revealed through archaeological techniques and remains; data on Aztec, Maya and Inca exemplify development of civilizations independent of Old World. Prerequisite: 113:3, 113:101 or 113:11.

113:162 Laboratory Methods in Archaeology arr.
Study of archaeological materials recovered by excavation and survey training in all aspects of laboratory research. Prerequisite: consent of instructor.

113:163 High Civilizations of Mesoamerica 3 s.h.
Archaeological data relating to the cultural development of civilization in the New World, with emphasis on complex civilizations; ethnohistoric materials incorporated wherever possible. Prerequisite: 113:3, 113:101 or 113:11. Alternate years.

113:164 Comparative Prehistory 3 s.h.
Cultural development in the Old World and the New World; emphasis on developments from preagricultural cultures to the appearance of urban civilizations; areas of primary concern are Mesoamerica, the Central Andes, the Near East, Egypt, the Indus Valley and China. Alternate years. Prerequisite: 113:3, 113:101 or 113:11.

113:166 Prehistory—Oceania 3 s.h.
Survey of prehistoric development and cultural origins of Australia and the Pacific islands. Alternate years.

113:168 Archaeology Theory and Method 2-3 s.h.
Techniques for the recovery of archaeological data and theories for their interpretation. Prerequisite: 113:11, consent of instructor or graduate standing.

113:169 Prehistory of South and East Asia 3 s.h.
Prehistoric development and cultural origins of Japan, China, mainland and island Southeast Asia and India. Same as 39:126.

113:268 Seminar: Archaeological Theory and Method arr.

113:199 Field Research in Archaeology arr.

113:299 Field Research in Archaeology arr.

Physical Anthropology

113:184 Human Evolution 3 s.h.
Understanding human evolution through study of man's relationships to other organisms, geological time scale, major steps in vertebrate evolution, genetics and heredity, primates, living relatives of man, early hominids and fossil man. Alternate years. Prerequisite: 113:11 or consent of instructor.

113:185 Biological Anthropology 2-3 s.h.
Advanced introduction to biological anthropology emphasizing topics of human genetics, comparative primatology, fossil man and race in an evolutionary context. Prerequisite: 113:11 or consent of instructor.

113:186 Seminar: Human Osteology 2 s.h.
Normal and pathologic human osteology as applied to demographic and epidemiological analyses in archaeological investigations. Prerequisite: consent of instructor.

113:285 Seminar: Biological Anthropology arr.

Linguistics

113:171 Anthropological Linguistics 3 s.h.
Structures of spoken languages, emphasizing the techniques for collecting and analyzing linguistic data; the historical and geographical relationships among unwritten languages. Same as 103:171.

113:172 Language and Culture 3 s.h.
Language as a reflection of organization, variation and change in culture and society; its origins and role in human evolution. Same as 103:170.

113:174 Linguistic Anthropology 3 s.h.
Concentrated investigation of selected topics in the anthropological study of language (e.g., ethnographic semantics, sociolinguistics, writing systems, distribution of languages); topics covered will depend on instructor. Prerequisite: 113:171 or consent of instructor. Same as 103:174.

113:271 Seminar: Anthropological Linguistics arr.
Same as 103:220.

Applied Anthropology

113:151 Sociology of the Third World 3 s.h.
Economic development as a sociological problem; social institutions and social organization of underdeveloped areas; social and economic development programs; social change and the consequences of industrialization and urbanization in underdeveloped areas. Prerequisite: 113:3, 113:101 or 34:1. Same as 34:151.

Individual Reading and Research Projects

113:383 Independent Study: Anthropology arr.

113:384 Research: Anthropology arr.

113:385 Thesis arr.

Applied Mathematical Science

See "Mathematical Sciences."

Art and Art History

School director: Wallace J. Tomasini
Faculty: *professors* Robert Alexander, Byron Burford, Charles D. Cutler, Mauricio Lasansky, Julius Schmidt, John Schulze, Wallace Tomasini
associate professors Keith Achepohl, Wayne Begley, Hans Breder, Chung-hi Choo, Richard DePuma, Charles Hindes, Hung-shu Hu, Bunny McBride, Ben Moss, Virginia Myers, Ellwood Parry, Joseph Patrick, Howard Rogovin, Norval Tucker, George Walker, Marilyn Zurmuehlen
assistant professors Shelley Bennett, Stephen Bundy, John Dilg, Peter Feldstein, Stephen Foster, Ronald Graff, Robert Rorex, Stephen Schultz, Martha Taunton
instructors Sue Hettmansperger, Christopher D. Roy, Anthony J. Schmidt, James Snitzer
Degrees offered: B.A., B.F.A., M.A., M.F.A., Ph.D.

The University of Iowa School of Art and Art History is recognized as one of the ten leading university-based art schools in the United States. It pioneered the artist-teacher concept, appointing its teachers on the quality of their work rather than the number of their degrees; it was one of the first university-based art schools to bring established professional artists to its permanent faculty.

The emphasis on the creative production of its faculty reflected an educational philosophy which made Iowa one of the first universities to accept creative work for academic credit.

The School early established a tradition and achieved national recognition for large exhibitions of contemporary American painting and sculpture.

Its national image and position are maintained not only through the University of Iowa Art Museum, its program of exhibitions, and its growing collection of art works of all periods and nations, but also through its continuing program of employing visiting artists and lecturers of both national and international prominence.

It was among the first schools of art to join studio art with art history studies, reflecting the concept that the young artist will benefit from a formal study of the traditions of art, and a prospective historian from personal experience with the creative process.

The fluidity of its undergraduate and graduate programs in art history continues with the support of an excellent art library and a large collection of visual materials. The employment of visiting lecturers for short-term workshops in addition to the permanent faculty continues to keep students directly involved with current scholarship.

A number of the School's graduates enjoy success as practicing professional artists, art historians, art department administrators, museum directors and curators, theater designers and teachers. Regardless of employment depressions, Iowa graduates have traditionally continued to find acceptable positions. This condition continues, even though the emphasis has always been

placed on the fine arts and no "commercial" art is offered in the program.

As far as possible the design of academic programs is arranged to meet the individual student's needs. Intense as well as general programs in studio arts and history can be developed. The major requirements of the undergraduate program are broad and flexible, discouraging specialization. The art history major requires at least an introduction to studio work. The studio major requires development of a foundation in art history and in at least six areas of studio art. The aim of the joint curriculum is to give students a basic understanding of art and aesthetics; it does not focus on particular short-term styles.

Bachelor of Arts

The B.A. candidate in art or art history must earn at least 74 semester hours of credit in non-art courses, but may apply no more than 86 non-art credits toward the 124-credit total required for the degree.

The candidate must meet the cultural portion of the College of Liberal Arts' historical-cultural core requirement with 11:37 Form and Theory in the Visual Arts, and either 11:38 Art in the Western World or 11:42 Art in East and West.

Cross-listed courses originating in the School of Art and Art History may not be counted toward fulfilling the general liberal arts course and hour requirements.

Studio Emphasis

The B.A. degree with an emphasis in studio requires the following courses and credits in art:

History of Art

Four intermediate-level courses	12 s.h.

Studio

1A:1-2 Colloquium	2 s.h.
1A:3 Basic Drawing	2 s.h.
1A:4 Basic Design	2 s.h.
1A:5 Inter-dimensional Concepts	3 s.h.

At least one fundamental course from six of these studio (12 s.h.) areas:

Ceramics
Design
Drawing
Metalworking and Jewelry
Multimedia
Painting
Photography
Printmaking
Sculpture

No more than 50 semester hours of credit in art courses the School lists will be counted toward the 124-credit total required for the degree.

Regardless of the number of art credits transferred, transfer students majoring in studio must complete at The University of Iowa a minimum of three semester hours in art history and 12 semester hours in studio, beyond the basic studio courses and including at least two different studio areas.

Art History Emphasis

Major requirements for the B.A. degree with an emphasis in art history are:

Studio

As advised	9-12 s.h.

Art History

Intermediate and advanced	16 s.h.

Electives

Must raise the total of art courses to a minimum of 38 s.h. and may raise the total to a maximum of 50 s.h.; art courses may be taken beyond this level, but do not count toward the B.A. degree.

Non-art credits must include two or more semesters of a second foreign language and at least 16 s.h. in at least three of these areas:

anthropology, classics, drama, history, language, literature, music, philosophy, religion, or sociology.

Art Education

Students seeking the B.A. degree in art education may choose either the studio or art history emphasis, satisfying the requirements described above, and, in addition to the general requirements for teacher certification (see "College of Education"), must satisfy these specific requirements:

7E:143 Methods: Art	3 s.h.
7S:105 Advanced Methods: Art	3 s.h.
7S:187 Seminar: Curriculum and Student Teaching	3 s.h.

The following courses are elective:

7E:197 Aesthetic Education	2 s.h.
or	
7S:197 Aesthetic Education	2 s.h.
1E:230 Art Education and the Museum	3 s.h.

Bachelor of Fine Arts

The B.F.A. degree is not offered with a major in art history. Studio majors must apply to enter the program. Application is made following completion of at least a semester of work in the major studio area, but before completion of 50 s.h. in art.

The B.F.A. requires 62 semester hours of credit in School of Art and Art History courses, 62 in non-art courses. In addition to the general education and major requirements listed above for the B.A. degree with studio emphasis, the B.F.A. candidate must complete three courses in major studio beyond the fundamental course, and must complete at least the second semester of coursework in each of two minor studio areas. Art education majors in the B.F.A. program must meet the same teacher certification requirements as those in the B.A. program.

Undergraduate Transfer Students

Undergraduate transfer students majoring in studio must, at their first registration, show a portfolio to a faculty review committee, which will determine the student's placement in or exemption from the sequence of basic studio courses.

Transfer students planning to major in art history should meet with the professor in charge of art history to discuss the student's required minimum registration for courses in art history and studio.

Graduate Programs

A student who wishes to prepare for undergraduate teaching by combining the art history and studio areas may do so at the Master of Arts level as indicated in the

following program descriptions for those two areas. Such a combination generally requires one or two additional semesters.

Students admitted to the School for graduate study must subsequently meet clearance requirements to be recognized as candidates for the M.A. or M.F.A. degrees.

M.A. in Art History

An M.A. student in art history is expected to acquire a broad general knowledge of art history as an academic and humanistic discipline; become familiar with major periods and monuments of world art; and gain proficiency in techniques of research within selected areas.

Specific requirements include:

A B.A. or B.F.A. degree, with at least 18 semester hours of undergraduate work in art history;
A minimum of 30 semester hours of graduate-level coursework, with a grade-point average of 3.0 or higher; and
At least a one-semester intermediate (100-level) course completed with at least a B grade in each of these areas of art history:
Ancient (to 300 A.D.)
Medieval (300-1300)
Renaissance to Baroque (1300-1750)
19th Century to Modern
Oriental

Course distribution for the M.A. in art history is as follows:

1H:294 Seminar: Methodology of Art History and Criticism	3 s.h.
Two other art history seminars (with different instructors)	4-6 s.h.
Additional art history courses	14-21 s.h.
Studio	0-6 s.h.
Courses outside the school	0-9 s.h.

Students with little or no undergraduate studio training are required to take two courses in different studio fields; students with substantial undergraduate studio training will be exempted from the graduate studio requirement. A student preparing to teach in both the art history and studio areas will take 12 to 18 semester hours of studio coursework, with a minimum of 9 semester hours in one subject, in addition to the University's undergraduate requirement for a studio major, and will also satisfy the drawing requirement. Studio courses may be taken on an S/U basis.

M.A. candidates with undergraduate majors in art history are encouraged to take courses outside the School.

Within the first 20 hours of graduate work, the M.A. candidate will be expected to demonstrate the ability to read art historical writings in an appropriate foreign language, normally German or French, but other languages, including oriental languages, may be acceptable. This requirement may be satisfied by the Graduate School Foreign Language Test (GSFLT), examination by appropriate University of Iowa language department, satisfactory completion of the final semester of a Ph.D. language reading course, or satisfactory completion (at least a B grade) of the fourth semester of a college or university language course.

Qualification for the M.A. degree requires a comprehensive written and oral examination, broadly covering the entire field of art history. The student must take this examination within the two regularly scheduled examination dates following the semester in which he or she completes 30 semester hours of graduate work.

The student must prepare either a written thesis, for which three semester hours of credit may be allowed, or a substantial research paper (approximately 20-40 pages in length), which will be filed in the Art Library. The research paper may emerge from either seminar or regular coursework.

M.A. in Studio

The M.A. in studio may be taken with a major in painting, drawing, sculpture, prints, design, photography, ceramics, metalworking and jewelry, or multimedia. The degree requires:

The B.A. or B.F.A. in art equivalent to that offered at The University of Iowa (undergraduate deficiencies, if any, may be made up concurrently with, but are in addition to, graduate requirements);
A minimum of 38 semester hours of graduate work, including at least 12 semester hours in a major studio subject, a total of at least 21 semester hours in studio courses, 9 semester hours in the history and theory of art, and up to 8 semester hours of courses outside art and art history; and
Studio and written theses.

Graduate students who have not had drawing at The University of Iowa are required to take at least one drawing course during the first year.

A student preparing to teach in both the studio and art history areas may offer an art history minor of 15 semester hours, including 1H:294 Seminar: Methodology of Art History and Criticism and one other seminar. These hours are in addition to the university's undergraduate requirement for an art history major, and in combination with the undergraduate hours must satisfy the distribution requirement for art history.

M.A. in Art Education

Requirements for the M.A. in art education are:

The B.A. or B.F.A. in art equivalent to that offered at The University of Iowa;
Teaching certification in art;
Completion of 38 semester hours of graduate credit, including 18 semester hours of studio and art history in a ratio of two to one, eight semester hours in art education, and 12 semester hours to be specified after the student commences the program;
An oral and/or written examination in art education and a related field; and
A written thesis based on research in art education or art history, or a studio thesis, accompanied by a brief statement of the student's technical, aesthetic and/or psychological approach.

Master of Fine Arts (studio only)

The M.F.A. may be taken with a studio major in painting, drawing, sculpture, prints, design, photography, ceramics, metalworking and jewelry, or multimedia. The degree requires:

The M.A. degree in art equivalent to that offered at The University of Iowa;
A minimum of 60 semester hours of graduate work, including at least 12 semester hours in a major studio subject, at least six semester hours in a minor studio field, nine semester hours in art history and theory of art, and eight semester hours in courses outside the School;
Acceptance of studio thesis supervision and advisory responsibility by a member of the staff qualified in the student's chosen field of specialization;
Acceptance of responsibility for supervising the written thesis, where such is assigned, by a member of the art history staff; and

Formation of a faculty committee for review of the candidate's progress and final review and acceptance of the thesis.

Thesis credits earned in an M.A. program are not applicable toward the M.F.A. credit requirement.

Doctor of Philosophy (art history only)

The Ph.D. student is expected to have a broad general knowledge of art history and to acquire detailed knowledge of monuments, an understanding of artistic development, and a knowledge of methods of research within certain specialized areas of world art to be selected by the student in conjunction with appropriate faculty members in the School.

No more than 38 semester hours of credit earned in an M.A. program may be applied toward the 72 semester hours required for the Ph.D.
Course requirements beyond the M.A. program outlined above:

Two art history seminars (with two different instructors)	4-6 s.h.
Additional art history courses	18-28 s.h.
Courses outside the School	0-12 s.h.

Students holding the M.A. from another institution are required to take the School's M.A. comprehensive examination within the first two regularly scheduled examination dates following admission.

Within the first 15 semester hours of graduate work beyond the M.A., the doctoral student must demonstrate ability to read art historical writings in two appropriate foreign languages. For majors in European art, one language will normally be German; for majors in Oriental art, Sanskrit, Chinese, or Japanese may be acceptable. The language examination procedure is as explained in the M.A. program description.

The student must take a comprehensive examination in one major field (six hours) and two minor fields (three hours each) selected by the student in consultation with the adviser and approved by the art history faculty. At least one minor must be concerned with an art historical period or area remote from the major field. One minor field may be related to the major; this field may be in a discipline or disciplines outside the School, e.g., religion, history or philosophy.

The student must prepare a written dissertation constituting an original scholarly contribution to the field. Up to six semester hours of credit toward the art history course requirements may be allowed for dissertation preparation. The dissertation topic must be formally presented for faculty approval. The student is given a final oral examination on the dissertation.

Admission: Studio

Admission procedures for graduate studio programs include a screening and a final review of applications. First screenings are conducted at the screening committee's first regular meeting following receipt of all of the applicant's supporting material. Contact the School for meeting dates.

Painting, ceramics, design, metalworking or jewelry, or multimedia majors must submit slides and/or photographs of their work in their major field; only applicants who are in residence at the University may submit original work in these areas. Drawing majors must submit original drawings (include figure drawings). Printmaking majors must submit from 6 to 20 original prints and drawings. Photography majors must submit a selection of original photographs. Sculpture majors should send 8x10 black-and-white photos—slides, if color is important—of their work. Studio applicants must also submit examples of their work in other areas, and must submit three letters of recommendation.

Admission: Art History and Art Education

Applicants to the graduate program in art history must submit a term paper or other example of ability to write in the field.

Applicants in art education must submit both a term paper or other example of ability to write in the field, and a selection of slides or photographs of their creative work in two studio areas.

All applicants must submit three letters of recommendation.

Deadline for receipt of completed applications is June 15 for the fall semester, November 15 for the spring semester, or April 15 for summer registration.

Assistantships and Scholarships

Assistantships paying approximately $3,800 per academic year for 20 hours of departmental duties weekly are awarded to graduate students on a competitive basis. Half-scale assistantships are also available. The award of an assistantship entitles the recipient to the in-state tuition rate.

Scholarships paying partial or full tuition and entailing no departmental duties require at least a 3.0 cumulative grade-point average.

These financial aids are generally awarded to students who have been in residence for at least one semester, so that faculty members have had an opportunity to observe their performance and potential.

Facilities

School facilities include an art library containing 50,000 volumes; a visual materials library containing 170,000 slides and 80,000 photographs; an intaglio printshop; furnaces and equipment for large-scale iron and bronze casting processes, as well as facilities for welding and fabrication of steel sculpture; a well-equipped darkroom; kilns sufficiently large for life-size ceramic sculpture; a large shop for woodworking, metalworking and industrial design; electroforming equipment; and video equipment.

While not a School of Art and Art History facility, the University's Center for New Performing Arts involves School of Art and Art History people in most of its activities. The Center was established by the Rockefeller Foundation to encourage collaboration among such areas as art, dance, writing, film, music, and theater.

Courses

Art History

Primarily for Undergraduates

1H:2 Introduction to Primitive Art **3 s.h.**
Art of prehistoric and contemporary tribal cultures. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent.

1H:13 Introduction to Islamic Art **3 s.h.**
Art and architecture in Islamic world. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent.

1H:16 Introduction to Oriental Art **3 s.h.**
Art and architecture in India, Southeast Asia, China and Japan. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent. Same as 39:16.

1H:26 Introduction to Ancient Art 3 s.h.
Art and architecture of Mediterranean civilizations from Minoan times to age of Constantine. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent. Same as 14:26.

1H:40 Introduction to Medieval Art 3 s.h.
Art and architecture in Europe from 300 to 1400 A.D. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent.

1H:47 Introduction to Renaissance Art 3 s.h.
Art and architecture in Europe from early Renaissance to 1600. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent.

1H:53 Introduction to Baroque Art 3 s.h.
Art and architecture in Europe from 1600 to 1750. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent.

1H:62 Introduction to Modern Art 3 s.h.
Art and architecture in Europe and United States from late 18th century to present. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent.

1H:66 Introduction to American Art 3 s.h.
Architecture, painting, printmaking and sculpture from colonial times to present. Prerequisites: 11:37 and 11:38 or 11:42, or equivalent.

1H:80 Visual Experience Through Print Medium 2 s.h.

1H:90 Colloquium in Art History arr.
For senior art history majors.

For Undergraduates and Graduates

Note: Courses numbered above 100 have as prerequisite an introductory course in the appropriate art history area or permission of instructor.

1H:105 Primitive Art American 3 s.h.
Indigenous art in the Americas to the 19th century.

1H:110 Egyptian and Mesopotamian Art 3 s.h.
Sculpture, painting, architecture and minor arts from close of Stone Age to classical times in Egypt and Near East. Same as 32:198.

1H:113 Art of Islam 3 s.h.
Islamic architecture, painting and minor arts in Spain, North Africa, Egypt, Turkey, Syria/Palestine, Iraq, Iran, Afghanistan and India, ca. 600-1800 A.D. Same as 32:192.

1H:114 Buddhist and Hindu Iconography 2-3 s.h.
Historical development of religious imagery of Buddhism and Hinduism in India, Central and Southeast Asia, China and Japan. Same as 32:191.

1H:115 Art of India I 3 s.h.
Art and architecture of India from earliest period to ca. 1000 A.D., in relation to historical development of Buddhism and Hinduism. Same as 32:195, 39:181.

1H:116 Art of India II 3 s.h.
Art and architecture of India from ca. 1000 A.D. to the modern era, in relation to historical development of Hinduism and Islam. Same as 32:196, 39:182.

1H:117 Art of Southeast Asia 3 s.h.
Art and architecture of Greater India, including Burma, Thailand, Cambodia, Vietnam and Indonesia. Same as 39:169.

1H:118 Painting of India 3 s.h.
Wall-painting and miniature painting of India in relation to historical development of Buddhism, Hinduism, Jainism and Islam. Same as 32:199, 39:168.

1H:119 Art of China 3 s.h.
Art and architecture of China in relation to philosophies and religions (Confucianism, Taoism and Buddhism). Same as 39:159.

1H:120 Chinese Painting I 3 s.h.
Earlier Chinese painting from 4th century B.C. through 13th A.D., stressing figural style but also considering emergence of landscape. Same as 39:120.

1H:121 Chinese Painting II 3 s.h.
Later Chinese painting, stressing landscape of 14th through the 18th centuries, but considering sources in earlier periods. Same as 39:121.

1H:122 Art of Japan 3 s.h.
Art and architecture of Japan in relation to philosophies and religions (Shintoism, Buddhism and Zen). Same as 39J:156.

1H:123 Japanese Painting 3 s.h.
Japanese painting, tracing both Chinese influence and indigenous styles from 7th through early 19th centuries. Same as 39J:123.

1H:126 Early Greek Art 3 s.h.
The art of the Cyclades, Crete, and Mycenae from 3000 B.C., and Greek art from Protogeometric times (ca. 1000 B.C.) through the Archaic period (ca. 480 B.C.). Same as 14:110.

1H:127 Classical Greek Art 3 s.h.
Art and architecture in the Greek world from Early Classical period (ca. 480 B.C.) through the late 4th century B.C. Same as 14:111.

1H:128 Greek Vase Painting 3 s.h.
Development of Greek pottery techniques, styles, and subjects from Protogeometric period through Hellenistic times. Same as 14:114.

1H:129 Hellenistic Art 3 s.h.
Sculpture, painting, architecture, and minor arts of the Hellenistic period (ca. 330-30 B.C.) in Greece, Italy, Asia Minor, and Egypt. Same as 14:117.

1H:130 Etruscan Art 3 s.h.
Villanovan and Etruscan art, religion, and culture from Bronze Age until conquest of Etruria by Rome. Same as 20:111.

1H:132 Early Roman Art 3 s.h.
Art and architecture of Italy and the provinces from the Late Republic (ca. 100 B.C.) through the reign of Hadrian (138 A.D.). Same as 20:110.

1H:133 Roman Mosaics 3 s.h.
Floor, wall, and vault mosaics in the Roman world from the 2nd century B.C. to the 5th century A.D. Same as 20:112.

1H:134 Late Roman Art 3 s.h.
Art and architecture of Italy and the provinces from the Antonines through Constantine (138-337 A.D.). Same as 20:115.

1H:135 Early Christian and Early Byzantine Art 3 s.h.
Architecture, sculpture, painting and mosaics from 4th to 7th century in the West and to 15th century in the East. Same as 14:113, 32:197.

1H:137 Byzantine Art 3 s.h.
Same as 14:116.

1H:140 Medieval Art 3 s.h.
Art of early medieval period; from Dark Ages in Europe through Ottonian period, including contemporary insular art.

1H:141 Medieval Art 3 s.h.
Art of Romanesque and Gothic periods.

1H:143 Medieval Art 3 s.h.
Late Gothic period.

1H:144 Northern Renaissance Art 3 s.h.
International style art; French and Netherlandish art to 1500.

1H:145 Northern Renaissance Art 3 s.h.
German art, 15th and 16th centuries; 16th-century Netherlandish art through Bruegel.

1H:146 Northern Art 3 s.h.
Netherlandish art from Bruegel to Rubens.

1H:147 Italian Renaissance Art 3 s.h.
Painting, sculpture and architecture in Italy from 1250 to 1450.

1H:148 Italian Renaissance Art 3 s.h.
Painting, sculpture and architecture in Italy from 1400 to 1525.

1H:149 Italian Renaissance Art 3 s.h.
Painting, sculpture and architecture in Italy from 1500 to 1600.

1H:151 French Art 3 s.h.
French painting, sculpture, and architecture, 1500-1700.

1H:153 Southern Baroque Art 3 s.h.
Painting, sculpture and architecture in Italy and Spain from 1575 to 1700.

1H:154 Northern Baroque Art 3 s.h.
Painting, sculpture and architecture in the Netherlands and England from 1600 to 1700.

1H:156 18th-Century Art 3 s.h.
Architecture, sculpture and painting in the 18th century in Western Europe.

1H:159 Early 19th Century Art 3 s.h.
Architecture, sculpture and painting in Europe and United States from late 18th century to mid-19th, from Neoclassical Romanticism to Realism.

1H:160 Late 19th Century Art 3 s.h.
Architecture, sculpture and painting of the Western world in second half of the 19th century; Realism, Impressionism, Post-Impressionism.

1H:161 19th Century Architecture 3 s.h.
From Neoclassicism to the Art Noveau in Europe and America.

1H:162 Modern Architecture 3 s.h.
Architecture from 1900 to present in Europe and America.

1H:163 Modern European Painting 3 s.h.
1900 to World War II: Fauvism, Expressionism, Cubism, Futurism, Dada, Surrealism and Abstract Art.

1H:164 Modern Sculpture 3 s.h.
From Rodin to Surrealism, emphasizing European developments.

1H:166 American Art I 3 s.h.
Art and architecture in America from Colonial times through the Early Republic.

1H:167 American Art II 3 s.h.
Architecture, painting and sculpture in United States from 1825 to 1913.

1H:168 Modern American Art 3 s.h.
Painting and sculpture in United States from the Armory Show to World War II.

1H:169 American Art IV 3 s.h.
Painting and sculpture in the United States since World War II.

1H:170 Contemporary Art 3 s.h.
Developments in America and Europe from World War II to the present.

1H:176 Chinese Sculpture 3 s.h.
From Neolithic to Yuan; stylistic analysis, cultural, historical and iconographical context. Same as 39:176.

1H:180 History of Prints 3 s.h.
Presents the print both as an important art form and as influential carrier of styles and iconography from area to area, particularly in Europe from Renaissance.

1H:185 19th Century Photography 3 s.h.
Photography in Europe and America from the invention of the daguerreotype to 1900; emphasis on relationship of

artistic and photographic vision in the portrait, landscape, still life, and experimental work of major figures.

1H:186 20th Century Photography 3 s.h.
Photography in Europe and America from 1900 to the present; work of major photographers and artists using photographs, examined in detail. May not be repeated.

1H:190 Themes in Art History arr.

1H:194 Readings in Art History arr.

1H:195 Theory and Criticism in Modern Art 3 s.h.
The development and role of theory and criticism from 1900 to World War II.

1H:196 Theory and Criticism in Contemporary Art 3 s.h.
European and American criticism and theory from World War II to the present.

1H:197 Theory and Form in Western Art 3 s.h.
Relationship of criticism and theory to painting and sculpture in Europe.

Courses Primarily for Graduates

1H:210 Seminar: Problems in Egyptian and Mesopotamian Art 2-3 s.h.

1H:216 Seminar: Problems in Oriental Art 2-3 s.h.
Same as 39:255.

1H:226 Seminar: Problems in Ancient Art 2-3 s.h.
Same as 14:210.

1H:244 Seminar: Problems in Northern Renaissance Art 2-3 s.h.

1H:247 Seminar: Problems in Italian Renaissance Art 2-3 s.h.

1H:250 Venetian Painting 3 s.h.

1H:259 Seminar: Problems in 19th Century Art 2-3 s.h.

1H:262 Seminar: Problems in Modern Art 2-3 s.h.

1H:266 Seminar: Problems in American Art 2-3 s.h.

1H:285 Art History Workshop I arr.

1H:286 Art History Workshop II arr.

1H:287 Art History Workshop III arr.

1H:294 Seminar: Methodology of Art History and Criticism 2-3 s.h.
Use of library and other investigative resources; different types of problems in art history and criticism and their varying research requirements; scholarly presentation of research findings.

1H:300 Directed Studies arr.

1H:302 M.A. Written Thesis arr.

1H:303 M.F.A. Written Thesis arr.

1H:304 Ph.D. Thesis arr.

Studio

Note: Studio courses numbered through 99 are primarily for undergraduates and may not be repeated except where indicated. Studio courses numbered 100 through 199 may be repeated except where specified.

1A:1 Colloquium 1 s.h.
Basic and specific problems in the visual arts. Offered fall semester.

1A:2 Colloquium 1 s.h.
Spring semester. Continuation of 1A:1.

1A:3 Basic Drawing 2 s.h.
Two-dimensional visual language and media; examination of space and form; color. Prerequisite to other drawing, painting, and printmaking courses. Open to art majors only. May not be repeated. Corequisite: 1A:1 or 1A:2.

1A:4 Basic Design 2 s.h.
Two- and three-dimensional form and materials. Prerequisite to other design and photography courses. May not be repeated. Corequisite: 1A:1 or 1A:2.

1A:5 Interdimensional Concepts 3 s.h.
Group and individual projects in new and traditional interdimensional media. Prerequisite to ceramics, metalsmithing and jewelry, multimedia, and sculpture courses. Open to art majors only. May not be repeated. Corequisite: 1A:1 or 1A:2.

1B:1 Elements of Art 2-3 s.h.
For those who have little or no previous experience; drawing and composition, complemented by selected reading. Not open to studio majors.

1B:2 Elements of Art 2-3 s.h.
Continuation of 1B:1, emphasis on color. Not open to studio majors. Prerequisite: 1B:1.

1B:101 Individual Instruction in Elements of Art arr.

1C:60 Ceramics I 2 s.h.
Basic methods of forming, firing and glazing clay. May not be repeated. Prerequisite: 1A:5 or consent of instructor.

1C:61 Ceramics II 2-3 s.h.
Intermediate clay-forming techniques; clay and glaze formulation and preparation in kiln firing. May not be repeated. Prerequisite: 1C:60 or equivalent.

1C:167 Ceramic Sculpture 3 s.h.
Sculptural problems in various clay bodies and glazes. Prerequisites: 1N:15, 1C:60, and consent of instructor.

1C:170 Ceramics III 2-3 s.h.
Individual projects as approved by the instructors. Prerequisites: 1C:60, 1C:61 taken consecutively and consent of instructor. Cannot be repeated.

1C:171 Ceramics IV 2 s.h.
Advanced individual projects. Prerequisites: 1C:170 and consent of instructor. Cannot be repeated.

1C:172 Glaze Calculations 1-2 s.h.
Empirical and practical methods of glaze formulation; effects of various types of kilns, firing atmospheres and glazes. Prerequisites: 1C:170 or equivalent and consent of instructor.

1C:174 Kiln Construction 1-2 s.h.
Theory and construction of kilns. Prerequisites: 1C:170 or equivalent and consent of instructor.

1C:175 Ceramics Workshop arr.
Prerequisites: 1C:171 or equivalent, and consent of instructor.

1C:270 Individual Instruction in Ceramics arr.
Prerequisite: consent of instructor.

1D:10 Perspective and Shadow 2 s.h.
Theories of perspective and application of their basic principles to one-, two-, or three-point perspective scale drawings based on analytical specifications; principles of light, shadow; reflecting images. May not be repeated. Prerequisites: 1A:4 or equivalent, and consent of instructor.

1D:21 Problems in Design I—Form and Structure 2 s.h.
Materials and their formal and structural possibilities. Prerequisite: 1A:4.

1D:22 Problems in Design II—Form and Function 2 s.h.
Preliminary studies of products and how they are designed; will develop modeling skills and the graphic communication skills necessary to basic project development. Prerequisite: 1A:4.

1D:25 Lettering I 2 s.h.
Sensitivity to letter design developed through writing with broad nibbed pens, leading to built-up letters. Prerequisite: 1A:4.

1D:26 Graphic Design I 2 s.h.
Exploring communicative potential of visual material on two-dimensional surface; combining image and letter form; developing a visual vocabulary. Prerequisite: 1A:4.

1D:127 Lettering II 3 s.h.
Continuation of 1D:25; individual projects; development of calligraphic skills; book design and general graphic design. Prerequisites: 1D:25 or equivalent and consent of instructor.

1D:130 Design Seminar 1 s.h.
Clarifying studio problems; guest speakers from other areas invited to participate in open-forum discussions with students. Prerequisites: advanced standing and consent of instructor.

1D:133 Graphic Design II 3 s.h.
Continuation of 1D:26 including problems of visual communication designing for the printing processes. Prerequisites: 1D:26 and consent of instructor.

1D:135 Graphic Design Workshop arr.
Advanced problems in visual communication; individual projects; book design and production; architectural and environmental graphics. Prerequisites: 1A:4, 1D:26, 1D:133, and consent of instructor.

1D:137 Environmental Design I 3 s.h.
Essential technology, including drafting and rendering, employed in architectural and industrial design and related especially to environmental factors, human and geographical. Prerequisites: 1D:21 and 1D:22, or equivalent and consent of instructor. Same as 36T:123. Cannot be repeated.

1D:138 Environmental Design II 3 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architectural and machine resources man has developed. Prerequisites: 1D:137 and consent of instructor.

1D:141 Interior Design I 3 s.h.
Relationship of interior design to its architecture, its environment and to the human element; use of color, materials, furnishings and lighting in selected projects. Prerequisites: 1D:21 and 1D:22 and consent of instructor. Cannot be repeated.

1D:142 Interior Design II 3 s.h.
Continuation of 1D:141, including display design. Prerequisites: 1D:141 and consent of instructor.

1D:145 Industrial Design I 3 s.h.
Design considerations related to human factors, methods of manufacture and marketing. Prerequisites: 1D:21 and 1D:22 and consent of instructor. Cannot be repeated.

1D:146 Industrial Design II 3 s.h.
Design and development of products for mass consumption: special attention to new developments in technology and how they relate to human needs. Prerequisites: 1D:145 and consent of instructor.

1D:149 Advanced Problems in Design 3 s.h.
Individual projects for advanced students. Open to graduate students only. Prerequisite: consent of instructor.

1D:240 Individual Instruction in Design arr.

1F:6 Analytical Drawing 2 s.h.
Study of form and space in both natural and man-made contexts; drawing in relation to systems and process; principles of pictorial organization. May not be repeated. Prerequisite: 1A:3.

1F:7 Life Drawing I 2 s.h.
Drawing from human figure in varied media. May not be repeated. Prerequisite: 1A:3.

1F:103 The Media of Drawing 2-3 s.h.
Varied drawing media; development of a personal drawing idiom. Prerequisites: 1F:7 or equivalent and consent of instructor.

1F:105 Life Drawing II 3 s.h.
Drawing from figure model in varied media. Prerequisites: 1F:7 or equivalent and consent of instructor. Same as 36T:138.

1F:108 Drawing Workshop I 3 s.h.
Compositional drawing for advanced students; varied media. Prerequisites: 6 s.h. of 1F:105 or equivalent and consent of instructor.

1F:109 Drawing Workshop II 4, 6 s.h.
Compositional drawing for advanced students; varied media. Prerequisites: 6 s.h. of 1F:105 or equivalent and consent of instructor.

1F:205 Individual Instruction in Drawing arr.

1G:84 Introduction to Metalworking and Jewelry 2 s.h.
Basic metalworking techniques of fabricating, casting, raising, forging, and surface embellishment as applied to jewelry, holloware, and nonfunctional metal forms. Prerequisite for all advanced metalworking courses. May not be repeated. Prerequisite: 1A:5.

1G:184 Advanced Jewelry Making 3 s.h.
Development of individual style in jewelry with emphasis on advanced aesthetic concepts and exploration of fabrication, casting, repousse, granulation, reticulation, inlay, stone setting, and forging. Offered fall semester. Prerequisites: 1G:84 or equivalent and consent of instructor.

1G:185 Advanced Metalsmithing 3 s.h.
Personal form will be developed by using the smithing techniques of raising, forging, dye-forming, and shell structure construction. Offered spring semester. Prerequisites: 1G:84 or equivalent and consent of instructor.

1G:186 Metalworking and Jewelry Workshop arr.
Electroforming and advanced metalworking. Prerequisites: 1G:84, 1G:184, 1G:185 and consent of instructor.

1G:285 Metalworking Seminar 1 s.h.
Advanced problems in metalworking. Prerequisites: 1G:84 and consent of instructor.

1G:286 Individual Instruction in Metalworking and Jewelry arr.

1J:90 Multimedia I 2-3 s.h.
An extension of the traditional role of the individual artist into interdisciplinary areas and new materials, with emphasis on conceptual, environmental, video, and performance art. May not be repeated. Prerequisite: 1A:5.

1J:91 Intermedia I 2 s.h.

1J:100 Multimedia II 3 s.h.
Continuation of 1J:90. May be repeated. Prerequisite: 1J:90 and consent of instructor.

1J:101 Multimedia III 3 s.h.
Investigation into interdisciplinary activity with experience in poetry, dance, music, film, theater, and art. Prerequisites: 1J:90 and consent of instructor.

1J:102 Technomedia 2 s.h.

1J:104 Computer-aided Graphics 3 s.h.
Computer graphic language, machine capabilities, design planning and programming. Prerequisite: consent of instructor.

1J:105 Video 3 s.h.
Studio experimentation and individual projects in black and white and color video. Prerequisites: 1J:90 or equivalent and consent of instructor.

1J:201 Individual Instruction in Multimedia arr.
Prerequisite: consent of instructor.

1J:202 Individual Instruction in Technomedia arr.
Prerequisite: consent of instructor.

1K:9 Painting I 2 s.h.
Elementary course in painting in oil. Offered fall semester. May not be repeated. Prerequisites: 1A:3 and 1F:7 or equivalent.

1K:10 Painting I 2 s.h.
Continuation of 1K:9. Offered spring semester. May not be repeated. Prerequisite: 1K:9 or equivalent.

1K:46 Painting II 3 s.h.
Compositions emphasizing human figure. Offered fall semester. May not be repeated. Prerequisites: 1K:9 and 1K:10, or equivalent.

1K:47 Painting II 3 s.h.
Continuation of 1K:46. Offered spring semester. May not be repeated. Prerequisite: 1K:46.

1K:49 Undergraduate Painting Workshop 2-3 s.h.
Individual projects in any painting medium or combination of media. Prerequisites: 1K:48 and 1K:47, or equivalent. May be repeated.

1K:111 Watercolor Painting 3 s.h.
Prerequisite: 1K:10 or equivalent.

1K:115 Painting III 3 s.h.
Oil, gouache, watercolor, tempera, acrylic, and other media. Prerequisites: 1K:47 or equivalent and consent of instructor.

1K:118 Painting Workshop I 2 s.h.
Media, materials, and technical problems of contemporary painters. Prerequisites: advanced standing and consent of instructor.

1K:119 Painting Workshop II 4 s.h.
Media, materials and technical problems of contemporary painters. Prerequisites: advanced standing and consent of instructor.

1K:215 Individual Instruction in Painting arr.

1L:34 Fundamentals of Photography 2 s.h.
Use of camera, light meter and darkroom; theory of photography; and photographic history. Students provide own cameras. May not be repeated. Prerequisite: 1A:4.

1L:124 Projects in Photography 3 s.h.
Specific contemporary ideas and problems in photography. Prerequisites: 1L:131 or equivalent and consent of instructor.

1L:125 Color Photography 3 s.h.
Basic color printing, the making of color transparencies, procedures of color photography. Prerequisites: 1L:34, 1L:131, and consent of instructor.

1L:128 Documentary Photography 3 s.h.
Instruction in photography as a recording process and also as a means of capturing or reproducing nature as it exists at a point in time. Prerequisites: 1L:34 and 1L:131 and consent of instructor.

1L:129 Photomedia Workshop 3 s.h.
Alternative photographic procedures for producing photo imagery for the purpose of expanding aesthetic experience and enlarging the photographic vocabulary, e.g., gum bichromate, colotype, cyanotype. Prerequisites: 1L:34, 1L:131 and consent of instructor.

1L:131 Creative Photography 3 s.h.
Use of photographic tools, cameras and darkroom for understanding the expressive qualities of the graphic image; special attention to individual's personal response to visual elements; training in critical compositional values. Prerequisites: 1L:34 or equivalent and consent of instructor.

1L:134 Photo-Serigraphy 3 s.h.
Silk screen printing of photographic images on a variety of surfaces. Prerequisite: 1A:3, 1A:4, and consent of instructor.

1L:136 Advanced Problems in Photography arr.
Individual instruction; specialized research in photographic techniques. Prerequisites: 1L:131 and consent of instructor.

1L:231 Individual Instruction in Photography arr.

1M:11 Prints and Composition I 2 s.h.
Elements of printmaking in various media; etching, engraving, dry point; color prints; Renaissance techniques; pictorial composition. Not open to freshmen or sophomores. Prerequisites: 1F:7 and consent of instructor.

1M:31 Introduction to Lithography for Printmakers 2 s.h.
Fundamental techniques and characteristics of lithography. Prerequisites: 1M:52 or equivalent, and consent of instructor.

1M:51 Undergraduate Printmaking I 2 s.h.
Elements of printmaking in various media, using metal plate, etching, engraving, dry point, Renaissance techniques; pictorial composition. Prerequisites: 1F:7 and consent of instructor.

1M:52 Undergraduate Printmaking II 3 s.h.
Advanced work in etching, engraving, color prints; Renaissance techniques; advanced study of pictorial composition. May be repeated. Prerequisites: 1M:51 or equivalent and consent of instructor.

1M:122 Prints and Composition II 3 s.h.
Engraving, etching, dry point, woodcuts, color prints in all media; experimental studies in intaglio techniques; fine printing; Renaissance techniques; study of advanced pictorial composition. Prerequisites: 1M:52 or equivalent and consent of instructor.

1M:131 Lithography for Printmakers 3 s.h.
Development of technical characteristics of lithography. Prerequisite: 1M:122 or equivalent, graduate standing, and consent of instructor.

1M:222 Individual Instruction in Printmaking arr.

1N:15 Undergraduate Sculpture I 2 s.h.
Investigation of three-dimensional creativity through a variety of materials and techniques. May not be repeated. Prerequisite: 1A:5.

1N:16 Undergraduate Sculpture II 3 s.h.
Continuation of 1N:15 emphasizing broader and more experimental attitude toward three-dimensional possibilities. May not be repeated. Prerequisite: 1N:15.

1N:17 Undergraduate Sculpture Workshop 3 s.h.
For intermediate and advanced sculpture students with emphasis on individual work. Prerequisite: 1N:16 or consent of instructor.

1N:161 Graduate Sculpture I 3 s.h.
Special projects in all sculpture media. Also open to graduate nonsculpture majors and advanced undergraduates. Prerequisite: 1N:16 and consent of instructor.

1N:162 Graduate Sculpture II 3 s.h.
Advanced projects in all materials and processes; emphasis on individuality and self-direction. Prerequisites: 1N:161 and consent of instructor.

1N:164 Graduate Sculpture Workshop 2-3 s.h.
Advanced problems in sculpture; includes group activities and research projects. Prerequisites: 1N:161 and consent of instructor.

1N:165 Sculpture in Cast Metal 3 s.h.
Cast metal sculpture in iron, bronze and other nonferrous alloys; furnace design, construction and operation; alloying and metal-finishing methods; lost-wax investment;

ceramic-shell, self-set sand; melt-out experimental techniques. Open to undergraduates and nonsculpture majors. Prerequisites: 1N:16 and consent of instructor.

1N:166 Iron Foundry Workshop **2 s.h.**
Techniques of casting sculpture in iron. Offered as a summer session workshop. Prerequisite: consent of instructor.

1N:260 Individual Instruction in Sculpture **arr.**

1P:191 Textile Design: Printing and Dyeing **1-3 s.h.**
Introductory problems in fabric design, blockprinting, silkscreening, batik, tie-dye and fiber forms; lecture and studio projects. May be repeated with consent of instructor. Prerequisites: 1B:1 or 1B:2, 1A:4, or consent of instructor. Same as 17:160.

1P:192 Textile Design: Basic Weaving **3 s.h.**
Design and execution of handwoven fabrics through experimentation with colors, fibers and basic weaves. Prerequisites: 17:80, two basic studio art courses or permission of instructor. Same as 17:162.

1P:193 Textile Design: Forms and Fibers **1-4 s.h.**
Two- and three-dimensional design problems using fabric complexes and off-the-loom techniques. Prerequisite: 17:160 or 17:162 or consent of instructor. Same as 17:164.

1P:194 Introduction to Theatrical Design **3 s.h.**
Analysis of scripts for theater designers and technicians; mechanical drawing for theater; design of scenery, costume, lighting and makeup. Prerequisite: consent of instructor. Prerequisite or corequisite: 36T:119. Same as 36T:110.

1P:195 Introduction to Theatrical Design **3 s.h.**
Continuation of 1P:194. Prerequisites: 1P:194 and consent of instructor. Prerequisite or corequisite: 36T:134. Same as 36T:111.

1P:196 Production Design I **3 s.h.**
Projects in scenic, costume, lighting and property design. Prerequisites: 1P:195 and consent of instructor. Same as 36T:112.

1P:197 Production Design II **3 s.h.**
Individual assignments to develop ability in various areas of design; drill in media for rendering set and costume designs. Prerequisites: 1P:196 and consent of admissions committee. Same as 36T:113.

1P:198 Studio for Theatrical Design **3 s.h.**
Continuation of 1P:197. Prerequisite: 1P:197 or consent of instructor. Same as 36T:114.

1P:290 Individual Instruction in Textile Design **arr.**
Prerequisite: consent of instructor.

Art Education

1E:195 Methods and Material: Art for the Classroom Teacher **3 s.h.**
Projects, techniques and processes in art for the elementary teacher; combination lecture and studio; painting, drawing, printmaking, sculpture and crafts with materials and tools commonly available in the elementary school. Same as 7E:122.

1E:196 Concepts in Art Education **2 s.h.**
Overview of art education: history of development in U.S.; child and adolescent art; relationships with art and education; survey of literature; community art teaching experiences.

1E:198 Art Education Studio **3 s.h.**
Studio methods course relating art training to the processes of elementary and secondary school art teaching; application of studio methods to the teaching of children. Prerequisite: 1E:196. Corequisite: 7E:143.

1E:199 Individual Instruction in Art Education **arr.**
Prerequisite: consent of instructor.

1E:230 Art Education and the Museum **3 s.h.**
Methods of structuring appreciation experiences in museums for children and adults including the conducting of tours. Prerequisite: consent of instructor.

1E:243 Supervision and Curriculum Development in Art Education **2-3 s.h.**
Problems and responsibilities of art supervisor including curriculum, facilities, financing, supervision, in-service training and reporting; study of factors influencing art curriculum decisions; curriculum analysis, selection, organization, preparation and evaluation. Same as 7S:243, 7E:243.

1E:406 Research in Art Education **arr.**
Individual research under supervision; applicable to thesis preparation and to doctoral prospectl development. May be repeated for credit.

Astronomy

See "Physics and Astronomy."

Biochemistry

Department head: Edward C. Heath
Degrees offered: B.A., B.S., M.S., Ph.D.

Biochemistry is the study of the basic chemical processes which occur in all living systems. It is one of the most actively developing sciences, and promises to remain so for some time to come.

Biochemists generally work in laboratories, and/or classrooms. Those with the bachelor's degree are most often employed as research associates or laboratory technicians in a wide variety of situations in education, health service, industry or government, or in secondary school teaching, for which certification is also required.

Biochemists with advanced degrees—usually the doctorate— pursue teaching, research and/or administrative careers in universities, medical schools, hospitals, private research agencies, government laboratories and the food, drug, cosmetics, chemical, petroleum, and allied industries.

Undergraduate Programs

The Bachelor of Science program in biochemistry prepares the student upon graduation to work as a biochemist in certain positions with no further formal training. It is also an excellent background for graduate study in biochemistry and related sciences, or professional degree work in the health sciences.

In addition to the College of Liberal Arts general requirements, the Bachelor of Science degree in biochemistry requires:

22M:25-26 Calculus I-II	8 s.h.
or	
22M:35-36 Engineering Calculus I-II	8 s.h.
29:17-18 Introductory Physics I-II	8 s.h.
37:3 Principles of Animal Biology	5 s.h.
2:1 Introduction to Botany	4 s.h.
or	
61:157 General Microbiology	4 s.h.
or	
61:147 Survey of Immunology	3 s.h.
4:13 Principles of Chemistry I	3 s.h.
4:14 Principles of Chemistry II	3 s.h.
4:16 Elementary Chemistry Laboratory I	2 s.h.
4:121-122 Organic Chemistry I-II	6 s.h.
4:131 Physical Chemistry I	3 s.h.
4:132 Physical Chemistry II	3 s.h.
or	
99:135 Physical Biochemistry	4 s.h.
4:141 Intermediate Chemistry Laboratory I	2 s.h.
99:100 Seminar Undergraduate	0-1 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.
99:130 Metabolism	3 s.h.
99:131 Molecular Genetics	4 s.h.
99:140 Experimental Biochemistry	4 s.h.
99:155 Research Independent Study	at least 6 s.h.
(may be taken for Honors)	
Advanced biochemistry courses	1-3 s.h.
Advanced science electives	at least 17 s.h.

Bachelor of Arts

In addition to the College of Liberal Arts general education requirements, the Bachelor of Arts degree in biochemistry requires:

22M:15 Mathematics for the Biological Sciences	4 s.h.
22M:16 Calculus for the Biological Sciences	3 s.h.
29:11- 12 College Physics	8 s.h.
Biological sciences	9-10 s.h.
37:3 Principles of Animal Biology	5 s.h.
2:1 Introduction to Botany	4 s.h.
or	
61:157 General Microbiology	4 s.h.
Chemistry	17-20 s.h.
4:13 Principles of Chemistry I	3 s.h.
4:14 Principles of Chemistry II	3 s.h.

4:16 Elementary Chemistry Laboratory I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
4:130 Physical Chemistry for the Life Sciences	3 s.h.
Biochemistry	17-25 s.h.
99:100 SINAR Undergraduate	0-1 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.
99:130 Metabolism	3 s.h.
99:131 Molecular Genetics	4 s.h.
99:140 Experimental Biochemistry	4 s.h.
Advanced science electives	19 s.h.

Additionally, B.A. students intending to go on to advanced degrees in the biological or health sciences are advised to include four semester hours of senior research among their electives, as well as 4:122 Organic Chemistry II.

Honors Program

Honors may be earned by special work in 99:140 Experimental Biochemistry, and in research. In the latter case, work completed in 99:155 Research, Independent Study, and presented to the Department as a written report and an oral presentation in 99:100 Seminar: Undergraduate.

Teacher Certification

Biochemistry students planning to qualify for teacher certification should include 7S:100 Introduction to Secondary School Teaching, 7S:151 Methods: Physical Science, and 7S:152 Methods: Biological Science among the College of Education courses taken to meet certification requirements.

Graduate Programs, Facilities, Faculty, Courses

See "Biochemistry" in the College of Medicine section of the *Catalog* for descriptions of the Department's graduate programs and facilities and for its faculty roster and course offerings.

Botany

Department chair: Robert L. Hulbary
Faculty: *professors* Robert L. Hulbary, Robert M. Muir *associate professors* Wayne R. Carlson, Robert W. Cruden, Robert W. Embree, Thomas E. Melchert, Jeffry T. Schabilion, Richard D. Sjolund *associate professor emeritus* Henry L. Dean *assistant professors* Stephen D. Hendrix, Robert A. Kennedy, Wei-Yeh Wang

Degrees offered: B.A., M.S., Ph.D.; M.S. in biology, jointly with the Zoology Department

Botany is a science contributing to our understanding of plants, their structure, reproduction, function, distribution on the earth, diversity, evolution, behavior and relation to human affairs. The Department functions in the preparation of professional botanists for teaching and research positions. Many students majoring in botany are preparing to enter careers in fields related to the plant sciences, such as agriculture, forestry, horticulture, plant breeding, microbiology, and the chemistry of natural products, ecology, medicine, pharmacy, zoology.

The Bachelor of Arts Degree

In addition to the general requirements of the College of Liberal Arts, students majoring in botany are required to take:

2:1 Introduction to Botany	4 s.h.

One course in each of the following areas (20 s.h. total):

Genetics

2:102 Genetics	3-4 s.h.
2:104 Cytogenetics	3 s.h.
2:160 Genetics and Biogenesis of Cell Organelles	arr.

Physiology and Cell Biology

2:109 Plant Physiology	4 s.h.
2:110 Plant Physiology	4 s.h.
2:114 Structure and Physiology of Plant Cells	4 s.h.
2:125 Developmental Plant Physiology	3 s.h.
2:126 Developmental Physiology Laboratory	2 s.h.

Biology of Vascular Plants

2:11 Plant Diversity	4 s.h.
2:13 Biology of the Local Flora	4 s.h.
2:113 Plant Anatomy	4 s.h.
2:120 Paleobotany	4 s.h.
2:121 Quaternary Palynology	2 s.h.

Biology of Non-Vascular Plants

2:105 Phycology	4 s.h.
2:106 Bryology	4 s.h.
2:107 Mycology	4 s.h.

Taxonomy, Ecology and Evolution

2:101 Plant Taxonomy	4 s.h.
2:111 Plant Ecology	4 s.h.
2:112 Plant-Animal Interactions	3 s.h.
2:131 Evolution	4 s.h.

Two 100-level courses in botany or cognate fields (zoology, biochemistry, microbiology)	8 s.h.
Chemistry (inorganic, organic/biochemistry)	16 s.h.
22M:15 Mathematics for the Biological Sciences	4 s.h.
or	
22M:20 Elementary Functions	3 s.h.
or equivalent	

Recommended electives in related fields:

22M:25 Calculus I	4 s.h.
29:11-12 College Physics	8 s.h.
12:3 Principles of Physical Geology	2 s.h.
12:4 Principles of Historical Geology	2 s.h.
61:157 General Microbiology	4 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.

Botany majors are advised to obtain a strong background of courses in zoology.

Students preparing to teach in secondary schools should consult the College of Education regarding requirements for teacher certification.

The Honors Program

An undergraduate program leading to graduation with Honors provides opportunities for participation in independent research projects guided by professorial staff members. Prerequisites for admission to the program are senior standing and cumulative grade-point averages of 3.0 overall and 3.5 in botany.

In addition to the regular requirements for the B.A. degree, Honors students must complete three semester hours of research during the senior year, maintain the grade-point averages required for admission to the program, and pass an Honors examination at the end of the senior year.

Graduate Study

The Department offers graduate training in diverse areas. Many involve interdisciplinary training, and some, such as genetics and ecology, require extensive study outside the Department. For these reasons each student will be assigned a faculty guidance committee to help set goals for graduate training and to plan the course requirements necessary to achieve them. Candidates for advanced degrees in botany are required to perform some services as teachers or research assistants.

The Master's Degree in Botany

Advanced study may be undertaken with emphasis in anatomy, bryology, cell biology, ecology, genetics, development and morphogenesis, mycology, paleobotany, phycology, physiology or taxonomy. The master's degree may be earned by completing at least 30 semester hours of graduate study, including six semester hours in 2:225 Research Botany. The preparation of a thesis is optional.

Each student must:

Submit a program of study to be approved by a guidance committee;
Complete at least 16 semester hours of graduate courses in botany, as prescribed by the guidance committee, and including no more than six semester hours of 2:225 Research Botany and 2:229 Thesis Botany;
Achieve a grade-point average of 3.0 on all courses, other than 2:225, attempted up to the time of the final examination; and
Take a written and oral examination covering coursework and research experience.

Master's Degree in Biology

A student who has been regularly admitted to a graduate program in either the Department of Botany or the Department of Zoology may elect a course of study leading to the Master of Science degree in biology.

The degree requires at least 34 hours of graduate study without thesis, or 30 hours with thesis. Nonthesis candidates must take 4-5 s.h. of research, and thesis candidates must take at least 6-8 s.h. of research. Research credit can be earned by taking 2:225 Research Botany, 37:199 Introduction to Research and 37:303 Independent Study in Zoology.

Each student must submit a program of study to be approved by the department in which the student is enrolled. The program must include at least 8 s.h. of graduate courses in each of the two departments, exclusive of research, and may include 6-10 s.h. taken in supportive areas including biochemistry, microbiology, geology, and mathematics. The student must achieve a 3.0 grade-point average in all courses other than research attempted at the time of the final examination, and pass a written comprehensive final examination covering the graduate program. For thesis candidates, there is also an oral examination, based mainly on the work reported in the thesis.

Doctor of Philosophy

Specialization may be in any one of the fields listed under the master's degree. At least 72 semester hours of graduate credit are required.

The comprehensive examination tests the progress of students in understanding concepts and ideas in various divisions of botany, with some concentration in fields closely associated with the research specialty.

The thesis must be submitted to the examining committee at least two weeks before the examination. A final examination consists of an oral defense of the methods, results, interpretations, and conclusions presented in the dissertation.

Graduate Admission

General Requirements

All prospective graduate students should be thoroughly familiar with the requirements of the Graduate College. Applicants should submit Graduate Record Examination (GRE) aptitude test scores with their applications, if possible.

Departmental Requirements

If the entering student has little or no training in botany or biology, some introductory coursework will be required in accordance with the academic needs of the individual. In addition, mathematics at the level of analytic geometry and a year of organic chemistry are usually required of entering students. Courses prescribed by the student's guidance committee should be made up during the first year of residence; these courses may be taken for reduced graduate credit. Students entering with a B.A. or B.S. degree from an accredited college or university should submit:

Scores on the GRE verbal and quantitative tests adding up to at least 1100;
A transcript of undergraduate record showing a grade-point average on all courses attempted equal to 3.0; and
Letters of recommendation from at least three of their professors.

Students entering with an M.S. degree should submit:

Scores on the GRE verbal and quantitative tests adding up to 1200;
A transcript showing a grade-point average equal to 3.4 on all courses attempted at the graduate level; and
Letters of recommendation from at least three of their professors.

The numerical requirements listed above are not absolute. For example, a GRE score somewhat below the designated number may be compensated for by a high level of academic achievement as an undergraduate or a graduate student.

Special Facilities and Activities

Students conducting research projects requiring the cultivation of plants have access to greenhouses and special culture rooms with controlled environments. A plant physiology laboratory is available, with associated greenhouses.

There is an excellent departmental library in the building.

A number of research laboratories are equipped with standard and more sophisticated apparatus for research in growth regulation, photosynthesis, paleobotany, molecular genetics, cytogenetics, ecophysiology, pollination biology, morphogenesis, and cell biology. There are two transmission electron microscopes in a special laboratory. Students and staff may use the Scanning Electron Microscope Laboratory in the Zoology Building.

An herbarium for research and general study includes collections of more than 200,000 specimens. These standard specimens include extensive collections of seed plants and ferns from Iowa and the Midwest, special research specimens from Mexico and Central America, the Conard herbarium of bryophytes and the Martin collection of fungi and slime molds.

Within a few miles of the campus, a forest preserve is available for field trips and experimental projects. A biological field station at Iowa Lakeside Laboratory (see "Extension Division") on West Lake Okoboji in northwestern Iowa affords excellent conditions for summer study in field biology, limnology, phycology, aquatic ecology and plant taxonomy. Students frequently participate in field expeditions in the Canadian

Northwest, Mexico and Central America.

Qualified graduate students may use the University Computer Center in their research projects.

Courses

Primarily for Undergraduates

2:1 Introduction to Botany 4 s.h.
Cultural experience with biology of plant life; structure, function, reproduction and inheritance in plants. Recommended for students in general science, zoology and those preparing to teach science. May be continued by 2:11 or 2:13 to satisfy the natural science core requirement.

2:3 Iowa Flora 2 s.h.
Lecture, laboratory and field study of flowering plants representative of families commonly found in this region; their reproductive biology and identification.

2:11 Plant Diversity 4 s.h.
A survey of plant life emphasizing the structure, reproductive biology, ecological adaptations and evolutionary relationships of major plant groups. Prerequisite: 2:1 or equivalent.

2:13 Biology of the Local Flora 4 s.h.
Identification, recognition and reproduction of angiosperms and gymnosperms of Midwest emphasized; the ecology of woodland and prairie communities stressed. Field work when feasible. Prerequisite: 2:1 or equivalent.

2:80 Plant propagation 2-3 s.h.
Lectures and laboratory relating basic plant biology to standard horticultural and agricultural practices. Topics covered include seed and seedling development, control of growth, nutrition, disease control and reproductive processes.

2:90 Introductory Genetics 2 s.h.
Basic principles of Mendelism and modern genetics; mechanism of heredity with examples in plants, animals and humans.

For Undergraduates and Graduates

2:100 Plants and Human Affairs 2 s.h.
Study of the ways plants are useful to man: as food, for clothing and shelter. The social, economic and ecological significance of plants is considered.

2:101 Plant Taxonomy 4 s.h.
Principles of plant taxonomy as illustrated by study of variation within and relationship between selected families and orders of angiosperms. Prerequisite: 2:1 or equivalent.

2:102 Genetics 3 s.h.
Patterns of inheritance of genes and chromosomes; molecular nature of the gene; regulation of the gene action; relation of genetic systems to evolution. Prerequisite: 2:1 or 37:3 or equivalent. Same as 37:109.

2:103 Genetics Laboratory 1 s.h.
Illustrations of genetic concepts using *Drosophila*, *Sordaria*, corn. Corequisite: 2:102. Same as 37:110.

2:104 Cytogenetics 3 s.h.
Structure and function of chromosomes; process of recombination; chromosome aberrations, including translocations, inversions, duplications, deficiencies, dicentrics and rings; strandedness of the chromosome; significance of heterochromatin; meiotic mutants; controlling elements. Prerequisite: 2:102 or 2:126.

2:105 Phycology 4 s.h.
Structure and reproduction of algae, freshwater and marine, including cytology and phylogeny of representatives of major taxonomic groups. Prerequisite: 2:1 or equivalent.

2:106 Bryology 4 s.h.
Lectures, laboratory and field work dealing with development, structure and evolution of mosses and liverworts. Prerequisite: 2:1 or equivalent.

2:107 Mycology 4 s.h.
Morphology, cytology and taxonomy of fungi with study of representative groups. Prerequisite: 2:1 or equivalent.

2:108 Experimental Mycology 4 s.h.

2:109 Plant Physiology 4 s.h.
Experimental study of function in plants; cell physiology, water relationships and chemical syntheses. Prerequisites: 2:1 and organic chemistry.

2:110 Plant Physiology 4 s.h.
Experimental study of mineral nutrition, metabolism, growth and development of seed plants. Prerequisites: 2:1 and organic chemistry.

2:111 Plant Ecology 4 s.h.
Adaptations and interactions between organisms and their environment; topics include communities, succession, climax, history of geneecology, ecotype differentiation, breeding systems, pollination systems. Prerequisite: 2:1 or equivalent; a course in genetics is helpful.

2:112 Plant-Animal Interactions 3 s.h.
Ecology and evolution of plant-animal associations, effect of animals, especially insects, on individual plants or communities, resistance of plants to insect attack, pollination ecology. Prerequisite: 2:131 or 2:132 or consent of instructor.

2:113 Plant Anatomy 4 s.h.
Structure and organization of fundamental tissue systems of seed plants including development and differentiation of cell types comprising these tissues; relationships between structure and function. Prerequisite: 2:1 or equivalent.

2:114 Structure and Physiology of Plant Cells 4 s.h.
Lectures and laboratory work on plant cells and cellular organelles with emphasis on the relationship of their structure to their function; isolation of cellular components and evaluation of morphological evidence obtained by light and electron microscopy. Prerequisite: 2:1 or equivalent.

2:115 Botanical Microtechnique 3 s.h.
Lectures and practical instruction in preparation of permanent microscopic slides; methods of killing, sectioning and staining plant materials; standard cytological techniques; necessary for research in various fields of botany. Prerequisite: 2:1 or equivalent.

2:116 Field Ecology 4 s.h.
Correlation of vegetation and environmental factors; delineation of plant communities and populations; population dynamics and analysis of field data, methods for describing vegetation in quantitative terms. Prerequisite: 2:111 or 2:132 or consent of instructor.

42:117 Experimental Techniques 2 s.h.
Lecture and laboratory work with pH, sampling, colorimetry, spectrophotometry, chromatography and selected chemical analyses. Prerequisite: consent of instructor.

2:118 Experimental Techniques 2 s.h.
Continuation of 2:117, but may be taken as an independent unit; chemical analysis, enzyme studies and measurement of photosynthesis and respiration. Prerequisite: consent of instructor.

2:120 Paleobotany 4 s.h.
Most important groups of fossil plants; their structure, evolution, phylogenetic relationships and geological distribution. Prerequisite: 2:11 or equivalent or consent of instructor. Same as 12:127.

2:121 Quaternary Palynology 2 s.h.
Nature, origin, and use of pollen and spores in Quaternary time; field and laboratory study of pollen-bearing deposits; application to geological, ecological, botanical, and archaeological problems. Prerequisite: college geology or botany. Same as 12:128.

2:122 Paleopalynology 2 s.h.
Lecture and laboratory survey of pollen and spores through geologic time; morphology, taxonomy, paleoecology, and biostratigraphy of pollen and spores. Prerequisite: college geology or botany. Same as 12:129.

2:125 Developmental Plant Physiology 3 s.h.
The effect of development and environmental conditions on plant physiology, particularly photomorphogenetic responses. Prerequisite: 2:1 or equivalent; 2:109, 2:113 recommended.

2:126 Developmental Physiology Laboratory 2 s.h.
Conduction and interpretation of experiments illustrating the developmental and environmental aspects of plant physiology. Corequisite: 2:125.

2:128 Fundamental Genetics 3 s.h.
Nature and function of genetic mechanism; classical, molecular, developmental, population and evolutionary aspects. Prerequisite: 37:3 or equivalent; chemistry through 4:122 or 99:120 recommended. Same as 37:126.

2:129 Fundamental Genetics Laboratory 1-2 s.h.
Drosophila-centered application of genetic analysis. For zoology majors, graduate students, Honors students and others with appropriate interest. Corequisite: 2:128. Same as 37:129.

2:131 Evolution 4 s.h.
Evolutionary mechanisms; nature and sources of genetic variation; natural selection; origin and maintenance of adaptation; reproductive isolation and the origin of species; evolution of higher taxa. Prerequisite: 37:3 or 2:1 or equivalent. Same as 37:131.

2:132 Ecology 2, 4 s.h.
Ecology of organisms; adaptations to physical and biological environments; competition; predation; life history strategies; structure and dynamics of populations; interacting populations; communities and ecosystems. Lectures, discussion, problems, readings. Prerequisites: introductory course in biology, botany or zoology, and 22M:20 or equivalent. Same as 37:132.

2:137 Medical Mycology 4 s.h.
Basic techniques used in study of fungi which are pathogenic for man. Registration limited and on consent of the instructor. Same as 61:169.

2:151 Field Botany 3 s.h.
Recognition and identification of plants in the living condition; use of keys and manuals; principles of phylogeny of natural classification as evident under field conditions. Prerequisite: 2:1 or equivalent.

2:153 Special Topics arr.
Readings, conferences and written reports on phases of plant science of personal interest to students; plants in relation to various other fields of study. Prerequisite: consent of instructor.

2:156 Scanning Electron Microscopy 2 s.h.
The theory, instrumentation and methods of scanning electron microscopy are covered. Students are exposed to the proper operation and various applications of the microscope. Prerequisite: consent of instructor. Same as 37:156, 12:156, 60:274.

2:160 Genetics and Biogenesis of Cell Organelles arr.
Lectures and discussion of the genetics and function of cell organelles, such as chloroplasts and mitochondria. The interaction between nuclear and organelle genomes is considered. Prerequisites: a course each in genetics and biochemistry.

2:178 Advanced Genetics **4 s.h.**
Same as 37:178, 61:178, 99:178.

2:190 Experimental Plant Ecology **4 s.h.**
Lectures, laboratory exercises, and discussion of current and classical topics in plant ecology, including regulation of life history events, ecotypic differentiation, competition, pollination ecology, and herbivore plant interactions. Prerequisities: 2:111 or 2:132, and consent of instructor.

Primarily for Graduates

2:209 Advanced Plant Physiology **arr.**
Normal and abnormal physiology of plants; reading and references. Prerequisites: 2:109 or 2:110 or equivalent and one year of college chemistry or physics.

2:211 Seminar: Ecology **2 s.h.**
Professional seminar with lectures, discussions and literature reviews on selected topics in ecology. May be repeated for credit.

2:212 Seminar: Plant Physiology **1-2 s.h.**

2:215 Genetics Seminar **0-2 s.h.**
Lectures, discussions and seminars on selected topics in genetics; a specific topic will be selected each year; course may be repeated for credit. Prerequisite: 2:102 or 37:128 or consent of the instructor. Same as 37:215, 61:215, 99:215.

2:218 Introduction to Electron Optical Research Techniques **arr.**
Lectures and laboratory intended for advanced graduate students with definite plan to use techniques of electron microscopy in their research; theoretical and practical aspects of tissue preparation, thin sectioning, histochemistry, autoradiography, negative staining and shadowcasting of plane materials; theory, operation and maintenance of electron microscope. Prerequisites: 2:114 and consent of instructor. Same as 60:218, 61:218, 37:218, 99:218.

2:220 Advanced Electron Optical Research Technique **arr.**
Lectures and laboratory in specialized techniques of electron microscopy. Includes theory and practice of autoradiography, freeze-fracturing, cytochemistry, and other procedures. Prerequisites: 2:218 or equivalent and consent of instructor. Same as 60:220, 61:220, 90:220.

2:221 Seminar: Botany **0-1 s.h.**
Required registration for one hour of credit for botany graduate majors. Open to senior majors in botany and graduate students in other departments.

2:225 Research: Botany **arr.**

2:229 Thesis: Botany **arr.**

Chemistry

Department chair: H. Bruce Friedrich
Faculty: *professors* Norman C. Baenziger, Robert E. Buckles, Donald J. Burton, Dimitri Coucouvanis, Leodis Davis, John R. Doyle, Clyde W. Frank, H. Bruce Friedrich, Ronald T. Pflaum, Donald J. Pietrzyk, William C. Stwalley, Stanley Wawzonek
associate professors William E. Bennett, E.B. Buchanan, E. David Cater, Robert E. Coffman, Darrell P. Eyman, Vasu Nair, Kenneth M. Sando, Dwight C. Tardy
assistant professors Harold M. Goff, David F. Wiemer
Degrees offered: B.S., B.A., M.S., Ph.D.

Chemistry is the basic science which involves the study of molecular transformation. An understanding of the principles of chemistry is important not only for chemists but also for persons interested in all the biological and materials sciences.

Undergraduate Programs

There are two bachelor's degree programs in the Chemistry Department. The Bachelor of Science curriculum is the professional training program for students who intend to find employment as chemists; it also provides all the prerequisites for graduate work in chemistry and related sciences. The Bachelor of Arts curriculum provides some concentration in fundamental chemistry but with a wider choice of electives. This degree provides a good background for students who plan to enter medicine, dentistry and related professions, and for students who plan to do advanced work in such fields as biochemistry, microbiology, pharmacology, physiology, medicinal chemistry, oceanography, geochemistry and metallurgy.

Chemistry courses in the first two years of the bachelor's program also provide a good background in general and organic chemistry for biological science majors. General science majors should select their chemistry courses from those listed in the B.A. curriculum; 4:101 Elementary Quantitative Analysis and 4:130 Physical Chemistry for the Life Sciences may also be included in the general science curriculum. Core courses 11:25 (offered jointly with the Physics Department) and 11:26 provide an introduction to physical science for the nonscience major.

Chemistry majors should attempt to complete courses in organic chemistry, integral calculus, and introductory physics prior to their junior year. A special undergraduate adviser is available to help students design their own programs.

The Bachelor of Science Degree

The B.S. curriculum in chemistry is the professional training program leading to employment in the chemical industry and in government research laboratories. The present and future demand for B.S. chemists for research, control or process development work is excellent. The B.S. program also provides all of the prerequisites for graduate work in chemistry or biochemistry.

Chemistry Courses

4:13-14 Principles of Chemistry I-II
4:16-17 Elementary Chemistry Laboratory I-II
4:50 Chemistry Orientation
4:121-122 Organic Chemistry I-II
4:111-112 Analytical Chemistry I-II
4:131-132 Physical Chemistry I-II
4:141-142 Intermediate Chemistry Laboratory I-II
4:143-144 Advanced Chemistry Laboratory I-II
4:170 Advanced Inorganic Chemistry
4:161 Introduction to Research
4:162 Undergraduate Research

Mathematics

Selected courses to include integral calculus (22M:35-36 Engineering Calculus I-II recommended, 22M:25-26 Calculus I-II acceptable.)

Physics

29:17-18 Introductory Physics I-II recommended, 29:11-12 College Physics acceptable.

Foreign Languages

(Two semesters of German, French, or Russian.)

Electives

Advanced science elective courses plus credit earned in senior research must total a minimum of five semester hours. Advanced science electives may be chosen in the areas of chemistry, mathematics, astronomy, physics, engineering, nuclear sciences, biochemistry, microbiology, pharmacology, botany, zoology, geology, physiology.

The Bachelor of Arts Degree

The B.A. curriculum in chemistry provides a general education with some concentration in fundamental chemistry but with wider choice of electives. Students electing this program may qualify for high school teaching, provided the required hours of education are elected. By choosing the

proper electives, students planning to enter medicine, dentistry, or some other scientific field may meet the entrance requirements for such professions and also obtain the B.A. degree.

Chemistry Courses

4:13-14 Principles of Chemistry I-II
4:16-17 Elementary Chemistry Laboratory I-II
4:50 Chemistry Orientation
4:121-122 Organic Chemistry I-II
4:111-112 Analytical Chemistry I-II
4:131-132 Physical Chemistry I-II
4:141 Intermediate Chemistry Laboratory I
4:143 Advanced Chemistry Laboratory I

Mathematics

Selected courses to include integral calculus; 22M:35-36 Engineering Calculus I-II recommended, 22M:25-26 Calculus I-II acceptable.

Physics

29:11-12 College Physics acceptable; 29:17-18 Introductory Physics I-II recommended.

Foreign Languages

A minimum of four semesters in one language, which should be chosen from German, French or Russian.

Electives

Advanced courses in chemistry, biology, mathematics, physics or in other scientific areas are recommended.

Teaching Certification

The chemistry courses required for the B.S. or B.A. degrees satisfy the requirements for a major for teaching in secondary schools. Chemistry courses through organic chemistry satisfy the requirements for a teaching minor in chemistry. (See "College of Education.")

Graduate Study

The Department offers a full program of courses, research and seminars leading to the M.S. and Ph.D. degrees in the areas of analytical, inorganic, organic and physical chemistry and in chemical physics. Students seeking the Ph.D. degree in chemistry are required to demonstrate competence in each of four areas of chemistry. This can be accomplished by receiving a minimum 2.75 grade-point average in the courses listed below or by departmental examination. Candidates for the M.S. degree are required to obtain minimum grades of "C" in three of these courses or to meet the requirement by examination.

4:170 Advanced Inorganic Chemistry
4:171 Advanced Analytical Chemistry
4:172 Advanced Organic Chemistry
4:173 Advanced Physical Chemistry

Entering students will be given the opportunity to take exemption examinations to demonstrate competence in the areas listed above. These exams will be given at the opening of the academic year and will cover material equivalent to that given in the courses listed.

Master of Science Programs

The Department offers the M.S. degree, with or without thesis, in the areas represented above. Both programs require at least 30 semester hours. In the thesis program, this may include no more than eight hours in research.

The oral examination for the M.S. degree with thesis consists of a defense of the written thesis. A minimum grade-point index of 2.5 is requisite to admission for the master's examination. The examination for the M.S. degree without thesis covers graduate coursework.

Doctor of Philosophy Program

A program of study for the Ph.D. degree in the areas previously listed consists of a minimum of 72 semester hours of graduate work. The program of study includes the previously specified courses and courses in the major field of interest. The student must present a thesis covering the research.

An oral comprehensive examination in defense of a prepared research proposition is requisite to candidacy for the Ph.D. degree. Students who have demonstrated the required competence in the four areas of chemistry and who have maintained a minimum grade-point index of 2.75 are admitted to the oral examination upon presentation and preliminary approval of their research proposal.

A final oral examination is required of all candidates for the Ph.D. degree. The Ph.D. thesis and a manuscript of the publishable portion of the thesis must be defended satisfactorily before an examining committee.

Interdisciplinary Programs

The Department of Chemistry cooperates in interdisciplinary programs in applied mathematical sciences and in chemical physics. (See "Graduate College.") Students with undergraduate degrees in chemistry, physics, mathematics or engineering are eligible.

Languages

The Department does not require a proficiency in foreign languages as a part of the training for an advanced degree. However, students majoring in organic chemistry are required to demonstrate competence in the reading of German.

Teaching

The Department requires all graduate students in chemistry to teach as part of their training for an advanced degree.

Admission

An applicant for graduate admission should have a bachelor's degree in chemistry with a grade-point average above 3.0. Most of the graduate students who are admitted receive financial support, and application forms may be obtained by writing to the Department of Chemistry. Most assistantships and other appointments for the following academic year are filled by April 1, but there are occasional openings at the beginning of the second semester.

Facilities

The Department is housed in a five-story building containing two auditoria, ten lecture rooms, 21 undergraduate laboratories, 48 graduate research laboratories and a number of special purpose instruction rooms. Modern scientific equipment is available for research.

The Department's excellent library facilities are available to all students. The library contains standard reference works, textbooks and complete volumes of chemical and chemical engineering journals, and subscribes to 300 current scientific journals.

Courses

Primarily for Undergraduates

(Students planning to take more than one year of chemistry should take 4:13, 4:14 and 4:16. Students requiring only one year of chemistry may take 4:7, 4:8 and 4:9. Students requiring 8 s.h. of organic chemistry should take 4:121, 4:122 and 4:141.)

4:7 General Chemistry I 3 s.h.
Introduction to basic concepts of chemistry for students who do not plan to take more than one year of chemistry.

4:8 General Chemistry II 3 s.h.
Introduction to organic and biochemistry for students who do not plan to take more advanced courses in chemistry. Prerequisite: 4:7 or high school chemistry.

4:9 General Chemistry Laboratory 2 s.h.
Introduction to laboratory techniques for students taking General Chemistry II. Prerequisite or corequisite: 4:8.

4:13 Principles of Chemistry I 3 s.h.
Introduction to basic principles of chemical bonding and chemical reactions. Prerequisite: 22M:2 or high school equivalent.

4:14 Principles of Chemistry II 3 s.h.
Continuation of 4:13. Prerequisite: 4:13 or 4:7.

4:16 Elementary Chemistry Laboratory I 2 s.h.
Introduction to laboratory techniques for students taking Principles of Chemistry. Prerequisite: 4:13.

4:17 Elementary Chemistry Laboratory II 2 s.h.
Continuation of 4:16 for chemistry majors; emphasis on quantitative techniques and measurements. Prerequisite: 4:16.

4:50 Chemistry Orientation 0 s.h.
Chemistry curricula; methods of study; chemical profession; fields of chemical specialization; present and future developments. Required for all majors in chemistry each semester. One meeting per month as arranged. No prerequisite.

4:101 Elementary Quantitative Analysis 4 s.h.
First principles of quantitative analysis. Two lectures and two laboratory sessions weekly. Prerequisites: 4:14, 4:16.

4:111 Analytical Chemistry I 3 s.h.
Principles of modern analytical chemistry with an emphasis on instrumental methods of analysis. Prerequisite or corequisite: 4:131.

4:112 Analytical Chemistry II 3 s.h.
Continuation of 4:111, which is prerequisite.

4:121 Organic Chemistry I 3 s.h.
General principles illustrated by preparation and study of typical representatives of aliphatic and aromatic series. Prerequisite: 4:14 or 4:8.

4:122 Organic Chemistry II 3 s.h.
Continuation of 4:121, which is prerequisite.

4:127 Introduction to Polymer Chemistry 3 s.h.
Mechanisms and kinetics of polymerization reactions, structure, physical properties and preparative methods. Prerequisites: 4:122, 4:132.

4:130 Physical Chemistry for the Life Sciences 3 s.h.
Principles and applications of thermodynamics; transport phenomena: diffusion, sedimentation and the ultracentrifuge, membrane potentials; characterization of large molecules; elements of information theory. Prerequisite: 4:122 and one semester of calculus.

4:131 Physical Chemistry I 3 s.h.
Application of laws of physics to chemical phenomena. Prerequisites: 29:12 or 29:18, 22M:26 or 22M:36.

4:132 Physical Chemistry II 3 s.h.
Continuation of 4:131, which is prerequisite.

4:135 Introduction to Symmetry in Quantum Chemistry 3 s.h.
Elementary symmetry arguments applied to quantum chemistry problems. Prerequisite: 4:132.

4:141 Intermediate Chemistry Laboratory I 2 s.h.
Preparation, purification, identification and analysis of chemical compounds, principally organic compounds. Prerequisites: 4:121 and 4:16 or 4:9.

4:142 Intermediate Chemistry Laboratory II 2 s.h.
Preparation of organic and inorganic compounds, applications of spectroscopic methods of analysis, functional group analysis, chromatography. Prerequisites: 4:17, 4:141.

4:143 Advanced Chemistry Laboratory I 2-3 s.h.
Physical and analytical measurements. Prerequisites: 4:111 and 4:131.

4:144 Advanced Chemistry Laboratory II 3 s.h.
Continuation of 4:143, which is prerequisite.

4:153 Inorganic Synthesis 2-3 s.h.
Presentation of a variety of inorganic compounds. Prerequisite: 4:170.

4:161 Introduction to Research 1 s.h.
Information retrieval from chemical literature and patents, presentation and analysis of chemical research problems. Prerequisite: junior standing in chemistry.

4:162 Undergraduate Research 1-4 s.h.
May be repeated for credit. Prerequisite: 4:131 and consent of chemistry major adviser.

4:170 Advanced Inorganic Chemistry 3 s.h.
Advanced topics in inorganic chemistry. Prerequisite: 4:132.

4:171 Advanced Analytical Chemistry 3 s.h.
Discussions of theoretical basis of modern analytical techniques. Prerequisites: 4:112, 4:132.

4:172 Advanced Organic Chemistry 3 s.h.
General organic chemistry for advanced students. Prerequisites: 4:122, 4:142.

4:173 Advanced Physical Chemistry 3 s.h.
Physical chemistry for advanced students. Prerequisite: 4:132.

4:191 Chemical Pedagogy 0-1 s.h.
Technique and practice of presenting chemical principles and principles of self-learning to students. Prerequisite: senior standing.

Primarily for Graduates

4:201 Special Topics in Inorganic Chemistry 3 s.h.
Intensive study of selected areas of specialization within field of inorganic chemistry. Topics change annually; may be repeated for credit. Prerequisite: 4:170.

4:202 Coordination Compounds 3 s.h.
Formation, reactions, physical properties and structures of molecules formed by combinations of donor molecules with acceptor elements. Prerequisite: 4:170.

4:204 Physical Methods in Inorganic Chemistry 3 s.h.
Application of physical methods to problems in inorganic chemistry, with emphasis on recent developments. Prerequisite: 4:170.

4:210 Introduction to Analytical Research 3 s.h.
Laboratory methods and techniques for fundamental and applied problems in analytical chemistry. Prerequisite: 4:144.

4:211 Analytical Emission and Absorption Spectroscopy 3 s.h.
Theory and practice of qualitative and quantitative analysis by means of emission spectroscopy, ultraviolet, visible and infrared absorption spectroscopy; study of reactions in solutions; spectroscopy and chemical structure. Prerequisite: 4:171.

4:212 Electroanalytical Chemistry 3 s.h.
Theory and practice of electrochemical methods of analysis; potentiometric titrations, conductometric titrations, polarography, amperometric titrations, controlled potential electrolysis, etc. Prerequisite: 4:171.

4:213 Chemical Separations 3 s.h.
Principles and applications of gas, liquid, thin-layer, and exclusion chromatography, solvent extraction, distillations, and membrane methods.

4:215 Special Topics in Analytical Chemistry 3 s.h.
Topics change annually. May be repeated for credit. Prerequisite: 4:171.

4:221 Introduction to Organic Research 3-4 s.h.
Synthesis and purification of organic compounds; methods and techniques of structure determination. Prerequisites: 4:132, 4:142.

4:222 Interpretation of Spectra 3 s.h.
Interpretation of electronic, vibrational, magnetic resonance, and mass spectra of complex molecules. Prerequisites: 4:132, 4:172.

4:223 Special Topics in Organic Chemistry 3 s.h.
Topics change annually. Prerequisite: 4:172.

4:224 Physical Organic Chemistry 3 s.h.
Fundamental physico-chemical concepts of molecular structure, stereoisomerism, equilibria and reaction rates applied to organic compounds. Prerequisites: 4:132 and 4:172.

4:226 Mechanisms of Organic Reactions 3 s.h.
Application of basic mechanistic concepts to organic reactions. Prerequisite: 4:224.

4:229 Advanced Organications 3 s.h.
Discussion of preparation of complex organic compounds. Prerequisite: 4:172.

4:231 Statistical Thermodynamics 3 s.h.
Fundamental principles of statistical thermodynamics and elementary chemical kinetics. Prerequisite: 4:132.

4:232 Statistical Thermodynamics 3 s.h.
Advanced topics in statistical thermodynamics. Continuation of 4:231, which is prerequisite.

4:233 Quantum Chemistry 3 s.h.
Quantum mechanics of chemical systems; time-independent and time-dependent perturbation theory;

variational theory; Hartree-Fock theory; atomic structure and spectra. Prerequisite: 4:135.

4:234 Quantum Chemistry **3 s.h.**
Group theory; molecular orbital and valence bond theories and the Roothaan procedure; electronic, vibrational, rotational and spin resonance spectroscopies; quantum statistics; current topics. Continuation of 4:233, which is prerequisite.

4:235 Chemical Kinetics **3 s.h.**
Chemical kinetics and mechanisms of chemical reactions from a more theoretical viewpoint. Prerequisite: 4:132 or consent of instructor.

4:242 Physical Chemistry Topics **1-3 s.h.**
Statistics of linear polymers, or high-temperature chemistry, or modern topics; an alternate topic is covered each year course is offered; may be repeated for credit when topic varies. Prerequisite: 4:132.

4:243 Diffraction Analysis **2-3 s.h.**
Theory and methods of diffraction of electrons, neutrons and X rays by gases, liquids and solids; structure determination and computational methods. Prerequisite: consent of instructor.

Seminars

These courses present discussions of latest advances in the various fields of chemistry. Pre: consent of instructor.

4:281 Seminar: Analytical Chemistry **0-1 s.h.**

4:283 Seminar: Inorganic Chemistry **0-1 s.h.**

4:285 Seminar: Organic Chemistry **0-1 s.h.**

4:286 Seminar: Physical Chemistry **0-1 s.h.**

Research

4:290 Research in Chemistry **arr.**
Involves thesis work for advanced degrees; conference and laboratory work arranged. Prerequisite: consent of head of Department and major adviser.

Classics

Department chair: Roger A. Hornsby
Faculty: *professors* Margaret A. Alexander, Jonathan A. Goldstein, Roger A. Hornsby
professor emeritus Oscar E. Nybakken
associate professors Archie C. Bush, Erling B. Holtsmark, Donald F. Jackson
assistant professors Helena R. Dettmer, Cynthia P. Gardiner
assistant professor emerita M.K. Flickinger
Degrees offered: B.A., M.A., Ph.D.

In its broadest sense, classics is the study of ancient languages, literatures and cultures of the area surrounding the Mediterranean basin from approximately 2000 B.C. to 454 A.D. It embraces three civilizations: the Minoan-Mycenaean, Greek and Roman; two languages: Greek and Latin; and a geographical area including Europe, North Africa, Egypt and the Near East. The aim of the Classics Department is to understand and interpret the contribution of the ancient world to life in the present and the future.

Undergraduate Program

A training in classics is primarily humanistic, for it concentrates upon the aspects of human achievement which are the foundation of civilization. An undergraduate degree in classics gives a solid foundation for law, history, art, philosophy and religion, as well as for advanced work in classics. Recent graduates have become secondary and university teachers, lawyers, doctors, librarians, museum curators and bankers.

The Department offers majors in Greek, Latin, classics (combines the two) and, jointly with other departments, ancient civilization.

Major in Greek

Thirty semester hours minimum are required, of which 24 must be in Greek language courses, and which must include the following courses or their equivalents:

14:1-2 Elementary Greek	8 s.h.
14:11- 12 Second-year Greek	6 s.h.
14:121-122 Homer and Hesiod I-II	6 s.h.
14:161 Greece and Persia	3 s.h.
14:162 Fifth-century Athens	3 s.h.
14:171 Elementary Greek Composition	3 s.h.

A student majoring in Greek graduates knowing not only how to read the Greek language, but also knowing some of the major works of Greek literature, and something of the history of ancient Greece and the Near East of the seventh through the fifth centuries B.C., when most of the modern notions of political, artistic and social life began.

Major in Latin

Thirty semester hours minimum are required, of which 24 must be in Latin language courses, and which must include the following courses or their equivalents:

20:1-2 Elementary Latin (20:15 Latin Review is equivalent to 20:1-2)	8 s.h.
20:16-17 Intermediate Latin I-II	6 s.h.
20:81 Age of Cicero	3 s.h.
20:82 Age of Augustus	3 s.h.
20:171 Elementary Latin Composition	3 s.h.
Two Latin language courses, 100-level or above	6 s.h.

A student majoring in Latin will graduate knowing how to read Latin as well as understanding some aspects of the Roman republic and empire when Rome established its hegemony over the Mediterranean basin, laid the foundation of law for the Western World, and transmitted the culture of Greece to the West.

Major in Classics (Greek and Latin)

Thirty-six semester hours minimum are required, of which 30 must be in Greek and Latin language courses, and which must include 14:1-2, 14:11-12, 20:1-2, and 20:16-17, or their equivalents. The student will then choose a language of concentration and will take at least the third-year courses (14:121-122 or 20:81-82) and the elementary composition course (14:171 or 20:171), or their equivalents, in that language of concentration.

Major in Ancient Civilization

(Sponsored by the School of Art and Art History and the departments of Classics, History, and Religion)

The major concentrates on the ancient civilization of the Mediterranean world and draws on courses currently offered by various departments of the University. It is not primarily a preparation for a graduate degree program; nevertheless, it could be used as a very sound basis for preparation for teachers at the secondary and junior college levels. In addition to the normal college requirements for the B.A. degree, the following are the specific requirements of the major:

Ancient art	6 s.h.
Ancient history	6 s.h.
Ancient philosophy or religion	6 s.h.
Classics—either courses in translation or upper-division undergraduate courses in Latin or Greek	6 s.h.
Appropriate courses in art, history, philosophy, religion or linguistics	3 s.h.
Senior seminar	3 s.h.

Core Requirements

Undergraduates who major in Greek, Latin, classics, or ancient civilization are excused from four semester hours of the literature core requirement for the College of Liberal Arts, but must complete 11:1 The Interpretation of Literature. Ancient civiliza-

tion majors' core requirements in the historical-cultural sequence are limited to four semester hours.

Honors

For exceptional seniors who attained a 3.5 grade-point average in their first three years of classics courses, two courses are offered in Honors reading, one each semester of the senior year, for three semester hours of credit each semester. The readings and discussions are on either an ancient author or a field in ancient history or literature chosen by the student and the instructor. During the first semester the student presents an essay every other week; at the end of the second semester the student presents a long paper which is examined by at least three members of the department.

Graduate Program

For the general requirements of the Graduate College, including the comprehensive examinations, see "Graduate College."

Graduate students in classics may include in their program no more than six semester hours of courses numbered 101-160 and/or six semester hours of courses numbered 161-199, for a total of six credit hours from courses numbered 101-199.

M.A. in Greek, Latin, or Classics

A minimum of 30 semester hours of courses numbered 101 and above is required. Candidates in Latin who have had no Greek are normally expected to include at least elementary Greek in their programs. In addition, the course 14:201 Proseminar: Introduction to Advanced Study (three semester hours) is required. Special programs will be arranged for candidates who wish to prepare for teaching classics in English (general education courses, world literature, etc.).

Ph.D. in Classics

The degree requires an ability to read and write Greek and Latin, as tested in qualifying examinations; the reading of considerable portions of Greek and Latin literature as outlined on a reading list prepared by the student and his or her adviser and approved by the Department; a tested reading knowledge of German and French; passing written comprehensive examinations on ancient history, on Greek and Latin literature, and on a special field or author, together with a one-hour general oral examination; and writing and defending a dissertation embodying original research or interpretation of a classical subject. Required courses are:

*14:204-205 Rapid Readings in Greek	6 s.h.
*20:204-205 Rapid Readings in Latin	6 s.h.
*14:172 Advanced Greek Composition	3 s.h.
*20:172 Advanced Latin Composition	3 s.h.
Ancient art above 200 level	3 s.h.
14:201 Proseminar: Introduction to Advanced Study	3 s.h.
20:295 Sanskrit I	3 s.h.
or	
14:203 Indo-European Philology	3 s.h.
14:206 Greek Palaeography	3 s.h.
14:281-282 Greek Seminar	6 s.h.
20:281-282 Latin Seminar	6 s.h.

(*May be satisfied by examination.)

(One of the seminars normally is taken after comprehensive examinations.)

Special Facilities

Extensive collections of classical texts and periodicals in the University Library and the Art Library facilitate research in the major areas of Greek and Roman civilization.

The Department has a varied collection of slides on classical subjects, and a small library.

Associated with the Department, the Classical Museum contains a valuable collection of coins, vases and facsimiles in bronze from Mycenae, Pompeii and Herculaneum.

The University is a supporting institution of the American School of Classical Studies at Athens, the American Academy in Rome, and the Vergilian Society, thereby making the facilities of those schools available to its faculty and graduates.

The University is also a contributing member of an international group which is sponsoring the uncovering and publication of information about the ancient mosaics of Tunisia. Annually a team from the University goes to Tunisia to work on this project.

Courses

Greek

For Undergraduates Only

Students wishing to satisfy the B.A. foreign language requirements by studying Greek should take 14:1-2 and 14:11-12.

14:1 Elementary Greek 4 s.h.
Fundamentals of Attic Greek and basic concepts of Greek civilization.

14:2 Elementary Greek 4 s.h.
Continuation of 14:1, which is a prerequisite; selections from Greek authors are read.

14:6 New Testament in Greek 3 s.h.
Rapid reading of selections from the Gospels. May be taken with or after 14:2.

14:11 Second-Year Greek 3 s.h.
Reading of selected texts of Greek prose and poetry. Prerequisite: 14:2 or equivalent.

14:12 Second-Year Greek 3 s.h.
Continuation of 14:11, which is a prerequisite.

For Undergraduates and Graduates

14:121 Homer and Hesiod I 3 s.h.
For third-year Greek students; selections from Homer's *Iliad* and *Odyssey* and from Hesiod's *Works and Days* and *Theogony* read in Greek; complete works read in English.

14:122 Homer and Hesiod II 3 s.h.
Continuation of 14:121, which is a prerequisite.

14:161 Greece and Persia 3 s.h.
For students in the fourth year of Greek; events leading to the Persian war, course of the war, and its immediate aftermath; Aeschylus's *Persae* and selections from Herodotus read in Greek; supplementary readings in English.

14:162 Fifth-Century Athens 3 s.h.
Changing intellectual climate of late fifth-century Athens and breakdown of Athenian democracy; selections from Thucydides, Sophocles' *Philoctetes*, Euripides' *Suppliants*, and Herodotus read in Greek; supplementary readings in English. Continuation of 14:161, which is a prerequisite.

14:171 Elementary Greek Composition 3 s.h.
Review of morphology and syntax and Greek sentence structure; composition of short passages in Greek.

14:172 Advanced Greek Composition 3 s.h.
Practice in writing idiomatic Greek prose with styles of Lysias and Demosthenes as models.

14:194 Seminar in Ancient Civilization 3 s.h.
Subject matter changes annually. Spring 1978 will be concerned with women in Ancient Rome. Included: Roman marriage patterns, imperial succession, legal status of women, typology of Roman kinship. No prerequisites. Sources in translation.

14:198 Undergraduate Seminar 3 s.h.
Intensive small-group discussion of selected philosophical problems. Same as 26:109.

14:199 Private Assignments 1-3 s.h.
Supervised individual study. For advanced students who are not majors in the Department. May be repeated.

For Graduates

14:201 Proseminar: Introduction to Advanced Study 3 s.h.
Advanced methods and disciplines: bibliography, textual criticism, paleography, epigraphy, history of classical scholarship. Required of all graduate students. Offered alternate fall semesters.

14:202 Advanced Reading arr.
Open only to graduate students in the Department.

14:203 Indo-European Philology 3 s.h.
Exposition of comparative method as applied specifically to Greek and Latin, and study of phonological and morphological laws.

14:204 Rapid Readings in Greek 3 s.h.
Offered alternate fall semesters.

14:205 Rapid Readings in Greek 3 s.h.
Continuation of 14:204. Offered alternate spring semesters.

14:206 Greek Palaeography 3 s.h.
Study of Greek papyri, manuscripts, early printed texts, stemmatics, and textual criticism.

14:210 Seminar Problems in Ancient Art 2-3 s.h.
Same as 1H:226.

14:223 Greek Lyric Poetry 3 s.h.

14:227 Homer 3 s.h.

14:230 Greek Lyric Poetry 3 s.h.
Detailed and critical reading of selections from Greek lyric poetry.

14:232 Sophocles 3 s.h.
Critical readings of selected plays.

14:233 Aeschylus 3 s.h.

14:234 Aristophanes 3 s.h.
Critical reading of selected plays.

14:235 Plato's *Republic* 3 s.h.
Examination of Plato's presentation of justice.

14:241 Herodotus 3 s.h.
Critical reading of the history.

14:242 Thucydides 3 s.h.
Reading and critical study emphasizing Thucydides' intellectual background and the aims of his history.

14:244 Polybius 3 s.h.

14:254 Aristotle's Political Writings 3 s.h.
Reading and discussion of the *Politics* and the *Ethics*.

14:260 Greek Novel 3 s.h.
Readings in Charlton, Xenophon of Ephesus, Longus, Achilles Tatius, and Heliodorus and epitomes in the *Bibliotheca* of the Patriarch Photius.

14:281 Greek Seminar 3 s.h.
Required of all Ph.D. candidates.

14:282 Greek Seminar 3 s.h.
Continuation of 14:281; required of all Ph.D. candidates.

14:291 Greek Thesis arr.
Open to Ph.D. candidates for the writing of the dissertation.

Latin

For Undergraduates Only

Students may elect 20:1 and 20:2, or 20:15 as part of their language requirement for the B.A. or B.S. degrees. Students with some high school Latin should enroll in 20:15. Students who have completed either 20:2 or 20:15 should next enroll in 20:16.

20:1 Elementary Latin 4 s.h.
Introductory study of Latin morphology and syntax; readings in Latin.

20:2 Elementary Latin 4 s.h.
Continuation of 20:1, which is a prerequisite.

20:15 Latin Review 4 s.h.
For students who have had some high school Latin, for general review. Not open to students who have passed 20:1 or 20:2.

20:16 Intermediate Latin I 3 s.h.
Reading of Latin prose and poetry. Prerequisite: 20:2 or 20:15, or two years of high school Latin.

20:17 Intermediate Latin II 3 s.h.
Prerequisite: 20:16 or equivalent.

20:61 Age of Cicero 3 s.h.
Cultural and social life of Rome in the last century of the republic; reading in Latin of selected authors such as Cicero, Sallust and Catullus; supplementary readings in English. Prerequisite: 20:17 or equivalent.

20:62 Age of Augustus 3 s.h.
Life in Rome in the first century of the empire; readings in Latin of Suetonius, Horace, Vergil, and *Res Gestae*; supplementary readings in English. Prerequisite: 20:61 or equivalent.

For Undergraduates and Graduates

20:117 Special Latin Review 3 s.h.
Rapid review of elements of Latin. May not be taken by students who have completed 20:1, 20:2, 20:15, or higher. Offered only in summer term.

20:119 Methods Foreign Language 3 s.h.
Aims, subject matter, textbooks and methods in secondary school teaching. Same as 7S:116, 9:150, 13:120, 35:130.

20:124 Lucretius 3 s.h.

20:126 Cicero Orations 3 s.h.

20:130 Latin Lyric Poetry 3 s.h.
Reading and criticism of selected Latin poems from writings of Catullus, Horace, Vergil, and later Latin poets. Prerequisite: 20:17 or equivalent.

20:131 Vergil's *Aeneid* I-VI 3 s.h.
Critical evaluation of first half of the epic.

20:134 Ovid 3 s.h.
Introduction to Ovidian poetry; concentrates on *Metamorphoses* and places the Augustan poet in the mainstream of Latin literature.

20:158 Tacitus 3 s.h.
Reading of historical works of Tacitus to illuminate Roman imperial period.

20:171 Elementary Latin Composition 3 s.h.
Latin sentence structure and composition of Latin essays.

20:172 Advanced Latin Composition 3 s.h.
Practice in writing idiomatic Latin prose, with styles of Caesar and Cicero as models.

20:179 Roman Satire 3 s.h.
History and nature of the genre with detailed analysis of writings of Horace, Persius, and Juvenal. Same as 48:179.

20:182 Silver Latin 3 s.h.
Reading from prose and poetry of Roman empire; emphasis on Martial's epigrams and Pliny's letters.

20:185 Medieval Latin 3 s.h.
Reading in authors chosen for content and as representing important types of medieval Latin. May be repeated.

20:193 Private Tutorial 1-3 s.h.
Limited to classics majors who have completed four years of Latin or equivalent.

20:199 Private Assignments 1-3 s.h.
Supervised individual study. For advanced students who are not majors in the Department. May be repeated.

For Graduates

20:202 Advanced Reading arr.
Open only to graduate students in the Department.

20:204 Rapid Readings in Latin 3 s.h.
Offered alternate fall semesters.

20:205 Rapid Readings in Latin 3 s.h.
Offered alternate spring semesters. Continuation of 20:204.

20:221 Early Latin 3 s.h.
Reading and discussion of the fragments of early Latin.

20:222 Plautus 3 s.h.

20:225 Cicero: Letters 3 s.h.

20:227 Cicero: Philosophical Works 3 s.h.
Reading and discussion of selected works of Cicero to understand his importance as both philosopher and transmitter of philosophy.

20:230 Lucretius 3 s.h.

20:232 Advanced Vergil I 3 s.h.
Includes Vergilian bibliography, *Appendix, Eclogues*, and *Georgics*.

20:233 Advanced Vergil II 3 s.h.
Concentrates on the *Aeneid*.

20:240 Sallust 3 s.h.

20:243 Livy 3 s.h.
Selections of literary, historical, and cultural interest from Livy's narrative.

20:260 Seneca: Drama 3 s.h.
Reading and discussion of essays and philosophical epistles.

20:270 Late Latin 3 s.h.
Readings in Latin prose and poetry written by pagan and Christian authors after the Silver Age and previous to the medieval period.

20:276 Roman Elegy 3 s.h.

20:280 The Roman Novel 3 s.h.
Readings in the *Apocolocyntosis* of Seneca, *Satyricon* of Petronius, and *Metamorphoses* of Apuleius.

20:281 Latin Seminar 3 s.h.
Required of all Ph.D. candidates.

20:282 Latin Seminar 3 s.h.
Continuation of 20:281; required of all Ph.D. candidates.

20:291 Latin Thesis arr.
Open to Ph.D. candidates for writing of dissertation.

20:295 Sanskrit I 3 s.h.
Introduction to Sanskrit grammar; selected readings from *Nala* and the *Hitopadesa*. Offered alternate fall semesters.

20:296 Sanskrit II 3 s.h.
Continuation of 20:295, which is a prerequisite. Offered alternate spring terms.

20:297 Vedic Sanskrit 3 s.h.
Philology and literature of the Vedas, with critical reading of selected texts; concentrates on the *Rig-Veda*. Prerequisite: 20:296 or the equivalent.

Classics in English

(No knowledge of Greek or Latin required)

For Undergraduates and Graduates

14:13 The Classical Views **4 s.h.**
Reading and discussion of the *Iliad*, the *Aeneid*, the *Metamorphoses* of Apuleius and one other work to introduce the student to the ancient classical view of man. Same as 11:13.

14:26 Introduction to Ancient Art **3 s.h.**
Art and architecture of Mediterranean civilization from Minoan times to age of Constantine. Prerequisites: 11:37, 11:38, or permission of instructor. Same as 1H:26.

14:102 Greek Civilization **2-3 s.h.**
Life, art and literature of the ancient world, especially Greece, and their relevance to modern times.

14:103 Women in Antiquity **2 s.h.**
Examination of attitudes toward and function of women in ancient Greek and Roman society; selected works of ancient authors, male and female, and modern critics. All readings in English.

14:105 Political Propaganda in Ancient Prose and Poetry **3 s.h.**
Literature of the Athenian revolutionary crisis of the 6th century B.C. (Solon's poems), of the developed Athenian democracy (including critics and enemies), and of the Pan-Hellenic movement and Graeco-Macedonian imperialism.

14:107 Greek Literature in Translation **2-3 s.h.**

14:108 Greek Drama in Translation **3 s.h.**
Greek drama as an art form, with analysis of selected plays and history of Greek theater. Same as 36T:169.

14:109 Greek Jewish Literature **3 s.h.**
Study, in English translation, of selected works written originally in Greek (history, fiction, preaching, and oracular, epic, and dramatic poetry), beginning with the earliest fragments and extending down to works of Philo and Josephus. Same as 32:143.

14:110 Early Greek Art **3 s.h.**
Architecture, sculpture, painting and minor arts from Mycenaean to Hellenistic times. Same as 1H:126.

14:111 Classical Greek Art **3 s.h.**
Continuation of 14:110. Same as 1H:127.

14:112 Classical Mythology **2-3 s.h.**
Lecture on classical myths and legends; for comparative purposes, nonclassical mythologies mentioned. Same as 106:105.

14:113 Early Christian and Early Byzantine Art **3 s.h.**
Same as 1H:135, 32:197.

14:114 Greek Vase Painting **3 s.h.**
Survey of Greek painted pottery from Protogeometric to Hellenistic times. Same as 1H:128.

14:115 Scientific and Medical Greek and Latin **2 s.h.**
Principles in derivation of scientific and medical terminology from Greek and Latin words.

14:116 Byzantine Art **3 s.h.**
Same as 1H:137.

14:117 Hellenistic Art **3 s.h.**
Same as 1H:129.

20:101 Greek and Latin for Vocabulary Building **2 s.h.**
Emphasizes memorization of Greek and Latin stems, prefixes, and suffixes; analysis of word-sets; principles of English word-formation. Lectures and exercises; opportunity for students' questions and participation. Six to eight quizzes; one final examination. Pass-fail permitted. Same as 6W:101.

20:102 Roman Civilization **2-3 s.h.**
Life, art and literature of the ancient world, especially Rome, and their relevance to modern times.

20:103 Medical and Technical Terminology **2 s.h.**
Computer-assisted instruction in medical and scientific terms derived from Greek and Latin; introductory meeting, no formal classes, students set their own pace and schedule; study guide with illustrations.

20:105 Roman Decadence **2-3 s.h.**
Lecture and discussion of changes in society, religion, economics, and government from 753 B.C. to 64 A.D.

20:106 Roman Drama in Translation **3 s.h.**
Roman drama as an art form, with analysis of selected comedies and tragedies and the history of Roman theater. Same as 36T:170.

20:110 Early Roman Art **3 s.h.**
Roman architecture, sculpture, painting and mosaics of republican, imperial, and late antique periods. Same as 1H:132.

20:111 Etruscan Art **3 s.h.**
Same as 1H:130.

20:112 Roman Mosaics **3 s.h.**
Same as 1H:133.

20:113 Religion and Occult in Antiquity **3 s.h.**
Investigation of the place of occult power in the early religion of Greece and Rome; magical influences on Graeco-Roman culture from outside during the pre-Christian period; the advent of eastern mystery cults. Same as 32:165.

20:115 Late Roman Art **3 s.h.**
Same as 1H:134.

20:201 Comparative Romance Linguistics **3 s.h.**
Same as 9:250, 35:250, 103:262.

Communication Studies

Program chair: John Waite Bowers
Faculty: *professors* John Waite Bowers (Speech), Hanno R.E. Hardt (Journalism), Robert S. Wachal (Linguistics)
associate professor James J. Bradac (Speech)
assistant professors Lary Beiman (Journalism), Larry Martin (Linguistics)
Degree offered: B.A.

In Communication Studies, the phenomenon of primary interest is instrumental symbolic behavior. Important questions include: How do we learn to use symbols? How does symbol usage differ across cultures and subcultures? How are linguistic and nonlinguistic symbols expressed in various media? What are the effects of linguistic and nonlinguistic symbols on attitudes and behavior? What evaluative criteria are appropriate for various classes of symbol-using behavior?

Diverse methods are appropriate for the study of communication. The scientific approach includes hypothesis generation, theory building, measurement, and other standard features of social science. Communication also can be studied with the critical and speculative tools of historians and philosophers.

The undergraduate program requires a minimum of 27 semester hours to be planned in consultation with an adviser so as to emphasize multidisciplinary approaches to communication. Four courses are required for all majors: 122:60 or 122:101; 122:80 or 122:81 or 122:82; 122:100 or 122:103; and 122:99.

Courses

122:60 Elements of Linguistics **3 s.h.**
Same as 6L:20, 103:20.

122:80 Communication and Contemporary Culture **3 s.h.**
Spring semester. Same as 36R:80; 108:80.

122:81 Mass Media and Mass Society **3 s.h.**
Same as 36B:25.

122:82 Communication Theory in Everyday Life **3 s.h.**
Same as 36:60.

122:90 Honors in Communication Studies **arr.**

122:99 Senior Seminar **1-3 s.h.**
Instruction and exercises in communication research methods: sampling, content analysis, cloze procedure, others. Synthesis of various methods in a common project. Spring semester.

122:100 Cultural and Historical Foundations Communication **3 s.h.**
Same as 19:101.

122:101 Introduction to Linguistics **3 s.h.**
Same as 103:100, 6L:100.

122:103 Social and Scientific Foundations of Communication **3 s.h.**
Same as 19:103.

Comparative Literature

Program chair: Paul Hernadi
Faculty: *professors* Stavros Deligiorgis, Paul Hernadi, Gayatri Spivak
associate professors Charles F. Altman, Dudley Andrew, R. E. Kuenzli, Donald Marshall, Alan F. Nagel, Maureen Robertson
assistant professors Steven Ungar, Daniel Weissbort
Faculty assisting in the Program: In addition to its own faculty, the Program in Comparative Literature calls upon the services of faculty members in various other areas, including classics, East Asian languages and literatures, English, film, French and Italian, German, history, Spanish and Portuguese, speech and dramatic art, and Russian.
Degrees offered: M.A., Ph.D.

The purpose of the Comparative Literature Program is to present literature as an interdisciplinary and international study and to provide a basis for intensive work in literature, literary theory and critical method. Undergraduates interested in comparative

studies are encouraged to investigate the major in letters, which is closely coordinated with comparative literature.

Master of Arts Degree

The degree of Master of Arts in comparative literature requires 36 semester hours of study of literature in an international context, with concern both for two or more national literatures and for the theory and general study of literature as a single phenomenon. The student in consultation with faculty advisers combines courses in the Program and in the individual departments to design a coherent course of study.

Formal degree requirements may be satisfied by a written examination on reading lists agreed upon by student and advisers, or by a written thesis and oral examination on the thesis and its relation to problems and issues in comparative literature. The M.A. may also be awarded after 45 semester hours of graduate study with a grade-point average of 3.25 and successful completion of the qualifying examination for the Ph.D.

Doctor of Philosophy Degree

Students seeking the doctorate in comparative literature study at least three literatures. One literature is studied in historical depth together with limited areas of specialization in two other literatures. An interdisciplinary area of concentration is encouraged. All candidates devote a portion of their program to comparative study which brings the several areas into focus. Specific areas and interrelations of these areas are selected by the student in consultation with appropriate faculty members.

Some typical critical and comparative areas are:

European Renaissance
Romanticism
Structuralism and post-Structuralism
Narrative theory
Symbolist poetics and modern literature
Post-Kantian philosophy and literature
Satire, rhetoric and the theory of social interaction
Literature, history and criticism
Literary-critical and psychoanalytic theory

Dissertation

The Ph.D. dissertation should demonstrate the candidate's ability to write a substantial piece of scholarship or criticism. A translation of a work of sufficient significance and linguistic complexity, preceded by a critical introduction, may be acceptable as a dissertation. The final oral examination centers on the dissertation and its background.

Admission

A study of literature across linguistic boundaries requires special training in languages. A thorough knowledge of at least one foreign language is required for admission to the M.A. course of study; knowledge of at least two foreign languages is a prerequisite for doctoral study. Students are strongly encouraged to offer at least one classical language.

For further information, the procedural guide for graduate students in Comparative Literature is available by request from the program offices.

Courses

Upper Division

48:108 European Literature of the 19th Century 3 s.h.
International and national perspectives on literary movements, works and authors before 1900. Same as 8:109, 108:110.

48:113 Literary Genres in European Literature I 3 s.h.
How genre definitions contribute to the understanding of related literary works; may deal with one or more genres (epic, romance, comedy, historical novel, etc.). May form a two-term sequence.

48:115 Literary Genres in European Literature II 3 s.h.
Continuation of 48:113. Same as 8:126, 108:126.

48:116 History and Theory of Translation 3 s.h.
Survey of the tradition of translation primarily in English literature and of the development of ideas about translation from Cicero to Pound; classical, biblical and contemporaneous areas are covered. Same as 8W:116, 108:116.

48:127 Contemporary Scene in Poetry 3 s.h.
Same as 108:125, 8:127.

48:128 Selected Modern Poets 3 s.h.

48:140 Contemporary Scene in Fiction 3 s.h.
Same as 8:140.

48:150 Literature and Society 3 s.h.
Same as 8:179, 108:150.

48:151 Literature and Anthropology 3 s.h.
Same as 8:151, 108:157, 113:109.

48:155 The Literary Tale 3 s.h.
Examination of structural features and social implications of the mode of oral storytelling in written literature; reading list includes both Western and Asian texts. Same as 39:155, 108:155.

48:158 East-West Literary Relations 3 s.h.
Same as 39:158, 108:158.

48:159 Russian Drama in Translation 3 s.h.
Same as 36T:158.

48:162 Literature and Revolution 3 s.h.
Topics range from literary representation to instigation of revolution, from rhetoric to ideology. Same as 108:162.

48:167 Literature and Psychology 3 s.h.
Literary texts, themes and theory, with emphasis on the interrelations of literary criticism, linguistics and psychology. Same as 8:175, 108:167.

48:171 The French Writer and Social Criticism 3 s.h.
Same as 108:171.

48:177 Literature and Art 3 s.h.
Same as 8:177.

48:179 Roman Satire 3 s.h.
Same as 20:179.

48:192 Dante and Romance Poetry 3 s.h.
Same as 8:192, 108:192.

48:199 Individual Study arr.
For advanced B.A. candidates with international and comparative literary projects, and for M.A. candidates in comparative literature.

Graduate Courses

48:200 Comparative Approaches I arr.
Introduction to theory and method of comparative literary studies. Required for M.A., recommended for doctoral candidates.

48:210 Studies in Style 3 s.h.
Given in Spanish.

48:211 Comparative Stylistics 3 s.h.
Same as 9:210.

48:245 Problems in Soviet Literary Theory and Criticism 3 s.h.
Introduction to the major writings of the Russian formalists (Shklovsky, Erkhenbaum, Tynianov), of the "Bakhtin circle" (Bakhtin, Medveden, Voloshinov), and of the recent work of Soviet structuralism (Lotman, Uspensky). Same as 41:245.

48:260 Translation Workshop arr.
Prerequisites: at least one classical or modern foreign language and permission of instructor. Same as 8W:260.

48:261 History of Criticism: Plato to 1700 3 s.h.
Theory of literature; emphasis on philosophical implications of theories arrived at in classical antiquity, the Renaissance and Neoclassical Europe, up to the age of romanticism. Same as 8:261, 36T:417.

48:262 History of Criticism: 1700 to 1950 3 s.h.
Theory of literature from Neoclassicism to the mid-20th century. Same as 8:262, 36T:418.

48:263 Issues in Contemporary Literary Criticism 3 s.h.
Same as 8:263.

48:274 Theory of Poetry 3 s.h.
Same as 35:274.

48:275 Narrative Modes 3 s.h.
Same as 8:276, 9:265.

48:277 Narrative Modes in Asian Fiction 3 s.h.

48:278 Theory and Technique of Oral Literature arr.
Experimental course centering on oral composition in ancient, medieval and modern world. Same as 8:278.

48:301 Comparative Approaches II arr.
Advanced comparative theory and method.

48:312 Advanced Readings in Black Culture arr.
Same as 8:312, 45:212.

48:321 Historical Criticism and the Study of Literary Periods arr.
Same as 8:321.

48:371 Byzantine and Post-Classical Studies I arr.
Late classical and Byzantine to modern Greek. Prerequisite: reading knowledge of classical or modern Greek.

48:372 Byzantine and Post-Classical Studies II arr.
Late Latin and romance literatures, including Romanticism. Prerequisite: upper- level language study in Latin or early romance languages.

48:373 European Renaissance 3 s.h.
Literature of the Renaissance, emphasizing genre and theme. Same as 8:373.

48:374 Baroque Neoclassicism 3 s.h.
Western literature, focusing upon the 17th century, with consideration of style, scientific and other themes, and historical and cultural interrelations central to the period. Same as 8:374.

48:375 Age of Enlightenment 3 s.h.
Selected texts in literature of rationalism and sensibility from Locke to Diderot. Prerequisite: reading knowledge of one modern foreign language. Same as 8:375.

48:376 European Romanticism 3 s.h.
Major figures in English and continental Romanticism, with emphasis on poets; questions about the unity of Romanticism and about the relations of Romantic to modern literature. Prerequisite: reading knowledge of one foreign language. Same as 8:376.

48:377 Recent European Poetry 3 s.h.
Critical treatment of major European poets. Prerequisite: reading knowledge of at least one modern European language (French, German, Spanish, Italian). Same as 8:377.

48:380 Intellectual Backgrounds of Literary Periods arr.
Examinations of the historical, political, aesthetic and other backgrounds of a period in relationship to literary texts. Same as 8:380.

48:381 Movements in European Literature 3 s.h.
Historical and critical study of one or more literary movements in Europe; discussion of characteristics and definitions. Prerequisite: reading knowledge of one modern European language. Same as 8:381.

48:382 Literary Genres and Modes 3 s.h.
Historical and theoretical study of one or more major literary kinds (epic, lyric, novel, comedy, tragedy, satire, etc.). Same as 8:382.

48:383 Patterns of Myth and Literary Forms 3 s.h.
One or more particular myths serve as the basis for investigating the definitions, methods and theories involved in relating myths and mythic thought to literary texts and practice. Readings (e.g., Frye, Barthes, Levi-Strauss, Freud) bear upon the criticism and interpretation of literary texts. Same as 8:383.

48:384 Types of Modern Criticism 2-3 s.h.
Selected topics in recent European and American criticism. Prerequisite: reading knowledge of one foreign language. Same as 8:384.

Comparative Seminars

Fluent reading knowledge of at least one foreign language is prerequisite for all seminars.

48:402 Seminar: Medieval Literature arr.
Relationships, influence, affinities, structure, etc., among writers, movements and styles.

48:403 Seminar in Genres and Modes arr.
Advanced studies in particular theoretical aspects of generic and modal criticism, its theory and practice.

48:404 Seminar: Medieval and Renaissance Literature arr.
Comparative problems in Medieval and Renaissance literature; topics differ from year to year.

48:405 Seminar: Stylistics 3 s.h.
Given in French; methods of research in literary history and criticism.

48:406 Seminar: Neoclassical Literature arr.
Studies in 17th- and 18th-century literature, with particular emphasis on Greek and Latin influences on European Neoclassicism.

48:407 Seminar: Teaching of Comparative Literature arr.
Methods and problems in teaching comparative literature; class discussion, directed reading and occasional participation in teaching comparative literature courses.

48:408 Seminar: Special Topics in Modern Literature arr.
Recent and contemporary literature in England, the United States and Europe.

48:409 Special Projects arr.
For doctoral candidates.

48:410 Thesis arr.

48:460 Seminar: Problems in Aesthetics and Literary Theory arr.
Same as 8:460.

48:463 Seminar: Literary Relations arr.
Same as 8:463, 36T:463.

48:471 Seminar: Literature and Other Arts arr.

48:472 Seminar: Literature and Communication arr.
Advanced specialized studies with emphasis on recent developments in pertinent areas of critical theory and practice. Same as 8:472.

Computer Science

See "Mathematical Sciences."

Dental Hygiene

See "College of Dentistry."

East Asian Languages and Literature

Department chair: Marleigh Ryan
Faculty: *professors* Hsi Ch'eng, Marleigh Ryan *professors emeriti* Pao-chen Lee, Y.P. Mei *associate professors* W. South Coblin, Maureen Robertson *assistant professors* Aichen Ting Ho, Sheldon Pollock *instructor* Elaine Gerbert
Supporting faculty: David Arkush (History), Robert Baird (Religion), Wayne Begley (Art and Art History), Paul Durrenburger (Anthropology), Cynthia Gardiner (Classics), Paul Greenough (History), Chong Lim Kim (Political Science), Douglas Madsen (Political Science), Wang Pachow (Religion), Robert Rorex (Art and Art History), Gerald Rushton (Geography), Richard Shutler (Anthropology), Stephen Vlastos (History)
Degrees offered: B.A., M.A.

Undergraduate Programs

The major purpose of the Department of East Asian Languages and Literature is to provide general courses through which all Iowa students have the opportunity to acquire knowledge and understanding of Asian cultures.

The Department offers two programs leading to the B.A., one primarily for those interested in studying the culture and civilization of traditional and modern Asia, and the other intended for those who wish to concentrate on developing competence in one of the Asian languages offered. Graduates of either program will find careers readily available in government, banking and commerce in America and Asia. The programs will also provide an excellent background for advanced study in literature, history, art, religion, political science, geography, anthropology, or sociology. Career opportunities in business, government, and teaching are plentiful at present and there is every indication that they will increase markedly in the next decade as trade and cultural exchanges with Asia develop further.

The Department urges its undergraduate majors to study in Asia as early as possible, and every effort is made to facilitate transfer of credit with universities in Asia.

Undergraduate majors are exempted from the literature core requirement and the historical-cultural core requirement of the College of Liberal Arts; the foreign language requirement is met by study of an Asian language.

The Program in Asian Studies

This is a multidisciplinary program designed to introduce students to East and South Asian culture, both modern and traditional, and to contemporary political and social problems in Asia. Asian historians join selected faculty in language and literature in teaching the courses. Each student selects a single area (e.g. China, Japan, or South Asia) upon which to concentrate for the study of language.

Required courses:

39:55-56 Civilizations of Asia	8 s.h.
39:19-20 Asian Humanities	8 s.h.

Asian language study:

For students of Chinese studies:
39:8-11 First-Second Year Chinese 24 s.h.

For students of Japanese studies:

39J:8-11 First-Second Year Japanese	24 s.h.

For students of South Asian studies:

39:21-24 First-Second Year Sanskrit	14 s.h.
39:193-194 Asia: Half the World	6 s.h.
Additional courses relating to Asia	6 s.h.

Major in East Asian Languages and Literature

Courses in history and literature provide an understanding of the cultural background for language study. Requirements:

39:55-56 Civilizations of Asia	8 s.h.
39:19-20 Asian Humanities	8 s.h.

Asian language study:

For students of Chinese:

39:8-11 First-Second Year Chinese	24 s.h.
39:105-106 Third Year Chinese	12 s.h.

For students of Japanese:

39J:8-11 First-Second Year Japanese	24 s.h.
39J:105-106 Third Year Japanese	12 s.h.

For students of Sanskrit:

39:21-24 First-Second Year Sanskrit	14 s.h.

Two semesters of:

39:188 Readings in Sanskrit Texts	3 s.h.

Students with previous knowledge of Chinese, Japanese, or Sanskrit will be tested before registration, and will be placed in the appropriate course at an advanced level.

Honors Program

Students with junior status who maintain a 3.25 G.P.A. or above are encouraged to enroll in the Honors Program. With the permission of the departmental chair and a faculty sponsor selected from among Asian specialists in any department, the student will register for 39:191 or 39:192 Honors Tutorial and 39:195 Senior Honors Thesis. To receive a B.A. with honors, the student must complete an acceptable thesis based on original research in an appropriate area of Asian studies.

Graduate Study

M.A. Program in Asian Civilization

Graduate study in Asian Civilization is designed to prepare students for careers in high school teaching, government service, or commerce where a knowledge of an Asian language and a broad regional background would be helpful. It also provides excellent preparation for advanced study on the doctoral level.

To receive an M.A. the student must complete 30 semester hours of coursework. All students are required to write an M.A. thesis in English using Chinese, Japanese, or Indian language sources. The thesis may count for 4 semester hours of the 30 required. All students must maintain a 3.0 G.P.A.

Students will be required to demonstrate language competence by passing a departmental examination at the conclusion of their program. Language competence for students of Chinese and Japanese will be at the level of the completion of fourth-year modern and first-year classical language; for students of premodern South Asia, at the level of the completion of third-year Sanskrit; for students of modern South Asia, at the level of the second-year Sanskrit.

In addition, students will be examined on the history of China, Japan, or South Asia, and in two appropriate areas from among the following options:

Chinese Anthropology
Chinese History
Chinese Linguistics
Chinese Literature
Chinese Philosophy
Chinese Art
Chinese Religion
Japanese Anthropology
Japanese History
Japanese Literature
Japanese Politics
Japanese Art
Japanese Religion
South Asian History
South Asian Literature
South Asian Art
South Asian Social Sciences
South Asian Religion

The Department can accommodate native speakers of Chinese or Japanese who wish to work toward professional competence in Asian civilization. A curriculum for such a student would exclude any modern language work, and would include 26 semester hours of content courses on Asia, and the four semester hours for the M.A. thesis. All candidates are expected to fulfill the general requirements of the Graduate College.

Graduate Admission

Applicants for admission must meet the general admission requirements of the Graduate College, except that a minimum grade-point average of 2.75 is required for conditional admission, 3.0 for regular admission. In addition, applicants must submit a specimen of their writing—such as a term paper, seminar paper, or graduation thesis—to the Department of East Asian Languages and Literature. All applications for graduate awards for the following academic year are due March 15. Applications for admission without support will be accepted until July 15 for the fall semester or December 15 for the spring semester. The candidate is advised to take the Graduate Record Examination at an early date, since an admission decision cannot be made until scores are received.

Library Facilities

Since 1960 the University Library has been purchasing all books on Asia issued by major publishers in Western languages. The Library's reference collection in the Chinese and Japanese languages is more than adequate for basic research; it includes approximately 38,000 books, periodicals, and microfilms. It is particularly strong in literature, history, art, and philosophy, and it is constantly being augmented by purchases of books and periodicals necessary for research on contemporary society. The Library regularly acquires publications from India in Pali, Sanskrit, and English.

Courses

Undergraduate Language Courses

39:1 Chinese for Non-Majors I 4 s.h.
Introduction to spoken Mandarin, with some instruction in writing characters; Chinese culture introduced through films, music and informal gatherings.

39:2 Chinese for Non-Majors II 4 s.h.
Further study of spoken Mandarin with more emphasis on the written language. Continuation of 39:1, which is prerequisite.

39:3 Chinese for Non-Majors III 3 s.h.
Continuation of 39:2, which is prerequisite.

39:4 Chinese for Non-Majors IV 3 s.h.
Continuation of 39:3, which is prerequisite.

39:8 First Year Chinese 6 s.h.
The course teaches the sound system of Mandarin Chinese, basic grammatical patterns, reading and writing Chinese characters; will satisfy the B.S. foreign language requirement. Fall.

39:9 First Year Chinese 6 s.h.
Together with 39:8 will satisfy the B.A. foreign language requirement. Spring. Continuation of 39:8, which is prerequisite.

39:10 Second Year Chinese 6 s.h.
Continues the audio-lingual approach of first-year Chinese; emphasizes the vocabulary and sentence structure of modern Chinese through newspaper articles, documentary writing and prose narratives. Fall. Continuation of 39:8 and 39:9, which are prerequisite.

39:11 Second Year Chinese 6 s.h.
Spring. Continuation of 39:10, which is prerequisite.

39:105 Third Year Chinese 6 s.h.
Reading of advanced modern Chinese texts with further practice in speaking and writing. Fall. Continuation of 39:11, which is prerequisite.

39:106 Third Year Chinese 6 s.h.
Spring. Continuation of 39:105, which is prerequisite.

39:21 First Year Sanskrit 4 s.h.
Introduction to the classical language of India; grammar and basic vocabulary, with some elementary readings.

39:22 First Year Sanskrit 4 s.h.
Readings in epic texts, beast fables and the story literature of medieval India. Continuation of 39:21, which is prerequisite.

39:23 Second Year Sanskrit 3 s.h.
Readings in the *Bhagavadgita* and related religious-philosophical texts. Prerequisite: 39:22 or permission of instructor.

39:24 Second Year Sanskrit 3 s.h.
Readings in epic and puranic texts, including the *Mahabharata*, the *Ramayana*, and the *Visnupurana*. Prerequisite: 39:23 or permission of instructor.

39J:1 Japanese for Non-Majors I 4 s.h.
Introduction to the modern spoken language for undergraduates, with emphasis on vocabulary useful for traveling and living in Japan; includes introduction to Japanese culture and civilization.

39J:2 Japanese for Non-Majors II 4 s.h.
Continued emphasis on modern practical spoken Japanese, with a brief introduction to the writing system. Continuation of 39J:1, which is prerequisite.

39J:3 Japanese for Non-Majors III 3 s.h.
Continued emphasis on practical spoken Japanese with further study of the modern written language. Continuation of 39J:2, which is prerequisite.

39J:4 Japanese for Non-Majors IV 3 s.h.
Continuation of 39J:3, which is prerequisite.

39J:8 First Year Japanese 6 s.h.
Intensive introduction to modern Japanese primarily for majors and graduate students; will satisfy the B.S. foreign language requirement. Fall.

39J:9 First Year Japanese 6 s.h.
Continuation of 39J:8, which is prerequisite; 39J:8 and 39J:9 together will satisfy the B.A. foreign language requirement. Spring.

39J:10 Second Year Japanese 6 s.h.
Continuation of 39J:9, which is prerequisite. Fall.

39J:11 Second Year Japanese 6 s.h.
Continuation of 39J:10, which is prerequisite. Spring.

39J:105 Third Year Japanese 6 s.h.
Reading of more difficult modern Japanese, with further practice in speaking and writing. Continuation of 39J:11, which is prerequisite. Fall.

39J:106 Third Year Japanese 6 s.h.
Continuation of 39J:105, which is prerequisite. Spring.

Language Courses for Graduate Students

39:108 Classical Chinese 3 s.h.
Introduction to classical Chinese of the late Chou period; readings will be primarily from *Chan-kuo-ts'e*, *Meng-tzu*, and *Chuang-Tzu* and will stress grammatical analysis and exact translation. Fall. Prerequisite: 39:11.

39:109 Classical Chinese 3 s.h.
Spring. Continuation of 39:108 which is prerequisite.

39J:108 Classical Japanese 3 s.h.
Grammar and readings in classical Japanese. Fall. Prerequisite: 39J:11.

39J:109 Classical Japanese 3 s.h.
Spring. Further readings in Japanese classical literature; continuation of 39J:108, which is prerequisite. Spring.

39:188 Readings in Sanskrit Texts 3 s.h.
Tutorial for advanced students of Sanskrit. Prerequisite: 39:24. Same as 32:188.

39:211 Fourth Year Chinese 3 s.h.
This course aims at further development of language proficiency through reading of modern texts. Fall. Prerequisite: 39:106 or equivalent as demonstrated by oral and written examinations.

39:212 Fourth Year Chinese 3 s.h.
Spring. Continuation of 39:211, which is prerequisite.

39J:211 Fourth Year Japanese 3 s.h.
Reading of advanced literary and expository texts. Fall. Prerequisite: 39J:106 or equivalent as demonstrated by oral and written examinations.

39J:212 Fourth Year Japanese 3 s.h.
Spring. Continuation of 39J:211, which is prerequisite.

39:213 Advanced Classical Chinese 3 s.h.
Selected readings from literary and historical texts of various periods. Continuation of 39:106 and 39:109, which are prerequisite.

Literature Courses in English Translation

39:19 Asian Humanities 4 s.h.
Characteristic literary texts of China or India in English translation. Required of all undergraduate departmental majors. Fall. Same as 11:19, 108:19.

39:20 Asian Humanities 4 s.h.
Characteristic literary texts of Japan. Required of all undergraduate departmental majors. Spring. Same as 11:20, 108:20.

39J:101 Zen and Literature 3 s.h.
From Basho to Salinger; appraisal of the literary manifestations of Zen Buddhism in Japanese poetry (read in English translation) and its influence on American writers of the 20th century. Same as 108:188.

39:135 Indian Literature 3 s.h.
Literature of ancient India in translation; epics, fables and popular tales. Fall.

39:136 Indian Literature 3 s.h.
Literature of ancient India in translation; court poetry and drama. Spring.

39:141 Survey of Chinese Literature I 3-4 s.h.
Development and characteristics of Chinese literature from 11th century B.C. to 10th century A.D., with emphasis on poetry. Fall.

39:142 Survey of Chinese Literature II 3-4 s.h.
Development and characteristics of Chinese literature from 10th century A.D. to present, with emphasis on fiction and drama. Spring.

39:143 Contemporary Chinese Literature 3-4 s.h.
Significant writers of May Fourth period; literary developments since beginning of the Communist regime.

39:144 Chinese Poetry 3 s.h.
Works from the "Golden Age" of classical Chinese poetry (7th-13th centuries).

39:148 Chinese Drama 3 s.h.
The development of traditional Chinese dramatic works in a historical context. Same as 36T:148.

39:155 The Literary Tale 3 s.h.
Broad readings in storyteller literature; a study of thematic, structural, and recitational characteristics of the tale. Same as 48:155, 108:155.

39:158 East-West Literary Relations 3 s.h.
Reading of Asian and Western literary works; exploration of the applicability of current critical ideas to both. Same as 48:158, 108:158.

39:241 Seminar in Chinese Literature arr.

39J:241 Early Japanese Literature 3 s.h.
Significant characteristics of Japanese poetry, poetic diaries, fiction and drama in the Nara and Heian periods. Fall.

39J:242 Medieval Japanese Literature 3 s.h.
Significant developments in poetry, fiction and drama in the Kamakura and Muromachi periods. Spring.

39J:243 Early Modern Japanese Literature 3 s.h.
Poetry, fiction and drama of the Tokugawa period, and early Meiji (17th-19th centuries).

39J:244 Modern Japanese Literature 3 s.h.
Fiction and poetry of the 20th century.

Civilization Courses—Instruction in English

39:5 Asian Civilization: China 3 s.h.
Historical and topical study of Chinese civilization, considering background, foundation, history, characteristics. Slides, musical tapes and demonstrations of artistic works.

39:16 Introduction to Oriental Art 3 s.h.
Introduction to the art of India, China and Japan. Same as 1H:16.

39:45 Living Religions of the East 4 s.h.
Selected historical and systematic aspects of the religions of India, Southeast Asia, China and Japan. Same as 11:46, 32:46.

39:55 Civilizations of Asia 4 s.h.
Introduction to the traditional cultures and societies of the three major civilizations of Asia: India, Japan and China. Required of all undergraduate departmental majors. Fall. Same as 11:55.

39:56 Civilizations of Asia 4 s.h.
Introduction to the modern history and present condition of Japan, India and China. Spring. Same as 11:56.

39J:60 Japan: the Living Tradition 2-3 s.h.
Introduction to traditional Japanese culture through videotapes and programmed instruction. Same as 113:60.

39:114 Study of the Written Character 2 s.h.
Analysis of the stucture and the historical development of Chinese characters. Prerequisite: 39:8 or equivalent.

39J:120 Japan Today 3 s.h.
Primarily for the nontraditional student, introducing topics of current interest to people who deal with Japan, whether in business, education or travel.

39:120 Chinese Painting I 3 s.h.
Deals with art-historical problems in the study of Chinese painting. Same as 1H:120.

39:121 Chinese Painting II 3 s.h.
Continuation of 39:120, but may be taken as a separate unit. Same as 1H:121.

39J:123 Japanese Painting 3 s.h.
Art-historical study of Japanese painting of successive periods; an effort is made to place the art in its general cultural context and to understand its overall development. Same as 1H:123.

39J:125 Ethnology of Japan 3 s.h.
Description and analysis of the origins and development of Japanese culture from prehistoric times until the present, with emphasis on modern Japanese society. Same as 113:125.

39:128 Prehistory of South and East Asia 3 s.h.
Prehistoric developments and cultural origins of Japan, China, mainland and island Southeast Asia, and India. Prerequisite: 113:11 or consent of instructor. Same as 113:169.

39:129 Ethnology of Southeast Asia 3 s.h.
Historical backgrounds and ethnology of mainland Southeast Asia exclusive of Vietnam; themes include ethnic identity, ecology, political organization and their relation to other social factors. Same as 113:129.

39:130 China and Japan: Comparing Cultures 3 s.h.
Analysis and comparison of the origin and development of Japanese and Chinese society from ancient to modern times. Same as 113:130.

39:133 History of Ancient and Traditional India 3 s.h.
Social and cultural survey of India from Harappan period through early Islamic period. Fall. Same as 16:193.

39:134 Imperialism and Modern India 3 s.h.
Indian history since 1500 A.D., emphasizing Mughal and British imperial systems, nationalist movements and present day socioeconomic trends. Spring. Same as 16:194.

39:138 Introduction to Chinese Linguistics 3 s.h.
General introduction to the syntax, morphology and phonology of the Mandarin Chinese language. Same as 103:144.

39:139 History of the Chinese Language 3 s.h.
Deals briefly with phonology of Mandarin and other major Chinese dialects, then proceeds to detailed treatment of reconstruction of Middle and Old Chinese. Prerequisites: knowledge of Chinese and permission of instructor. Same as 103:139.

39:145 Poetry in Chinese Painting 3 s.h.
Examination of the close relationship between poetry and painting in Chinese art and culture.

39:149 Chinese Theatre 3 s.h.
Introduction to the traditional theatrical art of China through study of the K'un Ch'u School as well as other schools of theater. A studio course. Same as 36T:144.

39:150 Contemporary Asia News Colloquium 2-3 s.h.
Reading and discussion of contemporary Asian affairs as reported in the Asian and United States press, emphasizing political and economic themes. Same as 16:191.

39J:150 Workshop on Japan 3-4 s.h.
An introductory overview of Japan and the Japanese people for the precollege educator; emphasis on ways of integrating aspects of Japanese civilization and culture into precollege curriculum and classroom studies.

39:153 Traditional China 3 s.h.
The development of Chinese civilization in premodern times, emphasizing ideas, social life and government institutions. Fall. Same as 16:195.

39J:153 Premodern Japan 3 s.h.
Study of the origins and development of Japanese polity and society from ancient times to the 18th century; emphasis on the transition from aristocratic to feudal social and political institutions. Same as 16:197.

39:154 Modern China 3 s.h.
The impact of the West, the decline of old China, the Chinese revolution and the reconstruction of Chinese society since 1949. Spring. Same as 16:196.

39J:154 Modern Japan 3 s.h.
The development of Japan as a modern nation state; topics include the Meiji Restoration, Japanese imperialism in Asia, the Pacific War, and postwar Japanese society. Same as 16:198.

39:156 Life in China Today 3 s.h.
Origins of Communist revolution and development of social and political system. Primarily for the nontraditional student.

39J:156 Art of Japan 3 s.h.
Art and architecture of Japan; aesthetic principles, stylistic developments, relation to philosophies and religions (Shintoism, Buddhism and Zen). Same as 1H:122.

39:157 Chinese Calligraphy and Painting 2-3 s.h.
Use of Chinese brush, paper and ink; development of Chinese calligraphy; types and methods of Chinese painting. A studio course.

39:159 Art of China 3 s.h.
Art and architecture of China, including aesthetic principles, stylistic developments, relation to philosophies and religions (Confucianism, Taoism and Buddhism). Same as 1H:119.

39:160 Chinese Religious Texts 2-3 s.h.
Critical study of Confucian, Taoist and Buddhist teachings; texts in English translation are selected for this course. Same as 32:154.

39:161 Religion in China 3 s.h.
Study of the main religions of China. Same as 32:152.

39J:161 Religion in Japan 3 s.h.
Survey of the main religions in Japan including Shintoism, Buddhism, Confucianism, Taoism and the leading religious cults from ancient periods to modern times. Same as 32:153.

39:162 Buddhist Sacred Texts 3 s.h.
Mahayana and Hinayana Buddhist texts are studied in English translation. Same as 32:155.

39:163 Indian Religious Texts 2-3 s.h.
Religious texts of ancient India in translation; Vedas and Upanisads or the Classical Period (in particular Samkhya, Yoga, Vedanta). Same as 32:156.

39:164 Buddhism in South Asia 3 s.h.
Buddhism in India, Burma and Ceylon; history, doctrines and modern expressions from ancient to modern times. Same as 32:149.

39:165 Mystical Experience and Social Concern 2-3 s.h.
Selected themes or movements in modern Indian religion. Same as 32:168.

39:166 The Bhagavad Gita and Its Modern Interpreters 2-3 s.h.
Examination of the text of Bhagavad Gita; attention is given to merits of various English translations. Spring. Same as 32:169.

39:167 Religion in India 3 s.h.
Careful study of the various religious traditions in India. Same as 32:151.

39:168 Painting of India 3 s.h.
Wall-painting and miniature painting of India are examined in relation to the historical development of Buddhism, Hinduism, Jainism and Islam. Same as 32:199, 1H:118.

39:169 Art of Southeast Asia 3 s.h.
Art and architecture of Greater India, including Burma, Thailand, Cambodia, Vietnam and Indonesia. Same as 1H:117.

39:170 Asian Religions in the United States 3 s.h.
Examination of selected religious movements which exhibit Indian religious influence and are prominent in the United States today. Same as 32:167.

39:174 Introduction to Chinese Philosophy 3 s.h.
Major schools of Chinese philosophy throughout history, mainly from 6th century B.C. to 16th century A.D.

39:176 Chinese Sculpture 3 s.h.
From Neolithic to Yuan; stylistic analysis, cultural, historical and iconographical context. Same as 1H:176.

39:178 Government and Politics of the Far East 3 s.h.
Introduction to important features of political institutions and processes in the Far East, concentrating on People's Republic of China, Japan and Korea. Same as 30:143.

39:181 Art of India I 3 s.h.
Art and architecture of India to ca. 1000 A.D., in relation to historical development of Buddhism and Hinduism. Same as 32:195, 1H:115.

39:182 Art of India II 3 s.h.
Art and architecture of India from ca. 1000 A.D. to the modern era in relation to historical development of Hinduism and Islam. Same as 1H:116, 32:196.

39:193 Asia: Half the World 3 s.h.
Interdisciplinary colloquium which analyzes Asian society through film, literature, and social scientific studies. Same as 108:147, 113:193.

39:194 Asia: Half the World 3 s.h.
As above. Spring. Same as 108:148, 113:194.

39:239 Seminar in Chinese Linguistics 2-3 s.h.

39:254 Seminar: Modern Chinese History arr.
Lectures on source materials and reference works, followed by preparation of an original research paper. Chinese not required. May be repeated for credit. Same as 16:291.

39:255 Seminar: Problems in Oriental Art 2-3 s.h.
Historical and cultural texts. Same as 1H:216.

39J:257 Readings: Japanese History arr.
Same as 16:294.

39:258 Topics in Modern Chinese History arr.
Graduate reading and discussion on selected topics. May be repeated for credit. Same as 16:292.

39:263 Seminar: Buddhism arr.
Research and reading in a selected Buddhist thinker or movement. Same as 32:215.

39:267 Seminar: Religion in India 3 s.h.
Research and reading in a selected Hindu thinker or movement. Same as 32:216.

39:290 Seminar in Pre-Modern Chinese History arr.
Advanced training for graduate students of history.

39:295 Readings in the History of India arr.
Same as 16:295.

Individual Study for Advanced Students

39:191 Honors Tutorial arr.
Fall.

39:192 Honors Tutorial arr.
Spring.

39:195 Senior Honors Thesis arr.

39:200 Methods of Teaching Chinese 3 s.h.
Introduction to basic principles of elementary language instruction. Prerequisites: 39:106 or the equivalent, and written permission of departmental chair.

39J:200 Methods of Teaching Japanese 3 s.h.
An introduction to the basic principles of elementary language instruction. Prerequisites: 39J:106 or the equivalent, and written permission of departmental chair.

39:215 Individual Chinese for Advanced Students arr.
Prerequisite: 39:212.

39J:215 Individual Japanese for Advanced Students arr.
Prerequisite: 39J:212.

39:216 Individual Sanskrit for Advanced Students arr.
Prerequisite: 39:186.

39:291 M.A. Thesis arr.
Fall.

39:292 M.A. Thesis arr.
Spring.

Economics

Department chair: Calvin D. Siebert
Faculty: *professors* Jerald Barnard, Anthony Costantino, Warren Dent, James Jeffers, Walter Krause (Murray Professor), Chester Morgan, Gerald Nordquist, Tom Pogue, Calvin Siebert, S. Y. Wu, J. Richard Zecher *professors emeriti* Paul Olson, George Peck *associate professors* William Albrecht, Michael Balch, Hyman Joseph, Larry Sgontz, Samuel Williamson *assistant professors* Susan Alexander, J. Frank O'Connor, Andrew Policano, Raymond Riezman
Degrees offered: B.A., B.S., B.B.A., M.A., Ph.D.

Economics is concerned with the organization of production and consumption in society, and the associated welfare of the people. It involves the systematic study of topics such as wealth and poverty, money and banks, income and consumption, government expenditures and taxation, prosperity and depression, inflation and unemployment, big business and labor unions, and hundreds of other matters which intimately affect the way people live.

Economics seeks to develop an understanding of how complex economic systems work, along with providing training in the methods of economic analysis which can be applied to a wide range of economic problems. Study of economics is desirable simply from the standpoint of being an informed citizen capable of exercising rational choice at the voting booth. Accordingly, the Department offers a wide range of coursework to meet the needs of the nonmajor as well as the major.

Undergraduate Programs

The baccalaureate programs in economics provide an excellent background for a variety of positions in business and government. Graduates find employment in banking, financial institutions, industrial firms and trade organizations, and in federal, state and local government agencies dealing with economic policy, regulations and analysis. Economics is also considered excellent preparation for law school and for graduate study in such fields as business management, public administration, health and hospital administration, urban and regional planning, transportation, journalism, political science and statistics.

The Department offers three undergraduate degrees—the Bachelor of Science and Bachelor of Arts in the College of Liberal Arts and the Bachelor of Business Administration in the College of Business Administration.

The B.A. and B.B.A. have the same major requirements, but their college requirements differ. The B.A. program is designed to allow the student maximum flexibility in attaining a well-rounded liberal arts education, while the B.B.A. program is designed to provide a background in the business fields of accounting, finance, marketing, business law and management.

The B.S. program has more quantitative content than the B.A. program, and is designed to prepare the student for graduate work in economics or related business and technical fields. The B.S. requires one year of foreign language, the B.A. two years.

Program for the B.A. Degree

In addition to the general College of Liberal Arts requirements in skills and core courses, including at least two years of a foreign language, these are the requirements for the B.A. major in economics:

Courses outside the Department

22S:25 Elementary Probability and Statistics 3 s.h.
or
22M:7 Quantitative Methods I 4 s.h.
and
22S:8 Quantitative Methods II 4 s.h.

Courses in Economics

20 semester hours of credit in 100-level courses, including 6E:103 Microeconomics and 6E:105 Macroeconomics.

(Most 100-level courses in economics have as prerequisites either 6E:1 Principles of Economics and 6E:2 Principles of Economics, or senior standing; 6E:1 and 6E:2 satisfy the social science core requirement.) Credit gained in 6E:100 Price, Employment and Production Theory cannot be counted toward the 20 semester hours of 100-level economics courses required for the B.A. degree.

Program for the B.S. Degree

In addition to the general College of Liberal Arts requirements in skills and core courses, including one year of a foreign language, the B.S. in economics requires these courses and electives:

22M:25-26 Calculus I-II

22S:120 Probability and Statistics
or
6E:183 Statistical Methods in Econometrics

20 semester hours of 100-level economics courses, including 6E:103, 6E:105 and 6E:184 Methods of Quantitative Economics

Credit earned in 6E:100 Price, Employment and Production Theory cannot be counted toward the 20-hour requirement.

Honors in Economics

Undergraduate students working toward the B.A. or B.S. degree with a major in economics are eligible to participate in the Honors Program in economics. The Honors Program offers the high-achieving student an opportunity to pursue special research interests. Honors students must complete four 100-level economics courses including 6E:103 and 6E:105 before their senior year, register for 6E:197 Senior Thesis in Economics for three hours of credit both semesters of their senior year, complete a senior thesis under direction of an economics faculty member of professorial rank and take (during the final semester of the program) an examination covering their departmental Honors work. A student satisfactorily completing the Honors Program receives his or her degree "with Honors."

Program for the B.B.A. Degree

The program for the B.B.A. degree is described in the College of Business Administration section of the *Catalog*.

Coursework for Nonmajors

6E:1-2 Principles of Economics satisfies the College of Liberal Arts social science core requirement, and provides an introduction to specialized topics of upper division courses. 6E:7 Contemporary Economic Problems and Policy gives students with limited exposure to economics an opportunity to examine the economics behind some current policy issues. Coursework in economics can be related to majors in many other fields—for example, in environmental studies, 6E:133 Economic Growth and Environmental Decay and 6E:103 Microeconomics; or in political science, 6E:119 Economics of the Government Sector and 6E:141 Industrial Organization. A number of students combine related interests by pursuing double majors in economics and, for example, computer science, geography, history, mathematics, political science, sociology or statistics.

Graduate Programs

The Department offers graduate instruction in the Master of Arts and the Doctor of Philosophy degrees. Each degree program has a separate theory and quantitative core enhanced by a set of field courses.

The M.A. degree program is designed to provide breadth in economic training without the requirement of specialization. The degree is usually completed within 18 months.

Areas of concentration offered by the department include: economic development, econometrics, economic history, health economics, history of economic thought, industrial organization, international economics, labor economics, economic theory and mathematical economics, monetary economics and policy, public finance, and regional and urban economics.

The Ph.D. program is designed to provide students with rigorous training in the areas of microeconomic theory, macroeconomic theory, mathematical economics, and econometrics. In addition, the student selects a major area for intensive study and specialization. The usual time required to complete the Ph.D. program is four years.

Each year the department offers a stimulating seminar program involving eminent economists from other universities and government, as well as presentations by faculty and student members of the department.

Courses

All courses offered in the Department are listed in the College of Business Administration section of the *Catalog*.

Education

See "College of Education" section.

English

Department chair: Richard Lloyd-Jones
Faculty: *professors* Sven M. Armens, Paul Baender, Marvin Bell, Vance Bourjaily, Merle Brown, Gerald Bruns, G. Robert Carlsen, David S. Chamberlain, Archibald C. Coolidge, Stavros Deligiorgis, Rhodes Dunlap, Hualing Nieh-Engle, John E. Grant, Ray L. Heffner, Paul Hernadi, John F. Huntley, W.R. Irwin, Donald Justice, Robert E. Kelley, Carl H. Klaus, Valerie Lagorio, John Leggett, Richard Lloyd-Jones, Frederick P.W. McDowell, John C. McLaughlin, David Morrell, David B. Morris, William Murray, Harry Oster, Sherman Paul, Robert F. Sayre, Gayatri C. Spivak, Oliver Steele, Albert E. Stone, Darwin Turner *professors emeriti* Joseph E. Baker, Angelo Bertocci, Paul Engle, John C. Gerber, Alexander C. Kern, Ernest P. Kuhl, Baldwin Maxwell, John C. McGalliard, William J. Paff *associate professors* J. Dudley Andrew, Florence Boos, William Clark, Carol de St. Victor, Wayne Franklin, Miriam Gilbert, David Hamilton, Rudolf E. Kuenzli, William Kupersmith, Susan Lohafer, Donald Marshall, K.K. Merker, Alan F. Nagel, John Rasburn, Robert F. Woerner *associate professor emeritus* Charles T. Miller *assistant professors* Kathryn Campbell, Paul Diehl, Lowell E. Folsom, John B. Harper, Richard Hootman, Brooks Landon, Cleo Martin, Adalaide Morris, Daniel Weissbort, Frederick Woodard
assistant professor emerita Alma B. Hovey
Degrees offered: B.A., B.A. in Letters, M.A., M.F.A., Ph.D.

Undergraduate Programs

The English Major

The broad purpose of the major in English is to provide a program of humane learning focused on the study of language and literature and the discipline of writing.

The immediate aims of the study of *literature* are to help students read the literary work in a variety of ways and to aid them in relating the work to other aspects of its culture.

The chief aim of the study of *language* is to help students examine historically and analytically the possibilities and limitations of language.

The chief aim of the training in *writing* is to help students explore and define human experience, especially their own. This training may involve either artistic or functional writing—or both. In either case the immediate goal is written expression that is both precise and forceful.

The English major is valuable training for every type of position calling for orderly and clear expression. Students who have majored in English at Iowa are now teaching in colleges as well as primary and secondary schools. They are practicing law and medicine; working for advertising firms, newspapers and book publishers; and for state and federal governments. Many others hold responsible positions in business and industry.

The only absolute requirement for the major in English is 30 hours of work in courses offered by the Department of English, including at least nine semester hours of work in courses dealing principally with literature written before 1800. In practice an English major ordinarily takes about 45 semester hours in English. At least 15 hours of coursework in English must be taken in residence.

With their advisers, students work out programs which seem best to meet their special needs and interests. Normally they begin with courses emphasizing close reading of selected literary works; later they study particular literary genres, and the literature and culture of selected historical periods. Often they take courses in such diverse subjects as folklore, literature and film, and printing and design. Concurrently they typically elect work in the history and nature of the English language and advanced training in writing. The latter may be imaginative writing (poetry, fiction, plays), functional writing (exposition, argument, technical reports, writing for social action) and/or the theory of rhetoric and stylistics. To buttress their study in the Department, English majors are encouraged to take as much work as possible in such fields as history, classical and modern foreign literatures, speech and the fine arts. Students planning to teach in primary or secondary schools will, of course, have to add appropriate courses in education.

As soon as students decide to undertake a major in English, they should consult with the

Director of Undergraduate Study in the English Office, who will assign them a faculty adviser. In the English Office, too, they may obtain a pamphlet on *Designing an English Major*, and other leaflets explaining departmental programs.

The Literature Semesters

Available at Iowa to all undergraduates, the two literature semesters presently offered are English Literature Before 1900, and American and Contemporary Literature. The latter covers American literature from its beginnings through the present day, as well as British literature since 1900. Each literature semester carries 12 hours of credit and involves as much reading as would be contained in four ordinary courses. Classes meet two hours a day, five days a week. Three professors attend all sessions, and the instruction is divided equally among them. Since all works are discussed and compared within and across the conventional historical divisions, the students undergo an intensive discipline in practical criticism. They write a paper a week, practice oral reading and productions of scenes from plays, and often write parodies, imitations and other exercises as means of increasing their sensitivity to literary styles.

The English Major with Honors

This major has the same general purposes as the regular major. In addition, it provides an opportunity for especially talented students to work independently and to graduate with special distinction.

The program for Honors majors permits considerable substitution of advanced work for the more elementary courses, requires registration in a special Honors seminar, and requires the writing of an undergraduate thesis. Each student works out his or her program with an Honors adviser.

Creative Writing

Many undergraduates come to Iowa because of the excellence of its creative writing program. With the consent of his or her adviser, any student may elect the undergraduate courses in this program. However, admission to the undergraduate workshops in fiction and poetry (8W:85-86 Undergraduate Writers Workshop Fiction-Poetry) is only by permission of the instructors. Manuscripts of representative work must be submitted to the Writers Workshop no earlier than a week before registration and no later than the last day of registration.

English and Education

The Department offers a flexible undergraduate program for students planning to teach English in elementary and secondary schools. Aside from the necessary courses in education, there are no requirements other than those mentioned above for the general major in English. However, students planning work which will help them in their first teaching experiences should remember that they will have to be able to work with details of expression in English. They will probably need advanced training in writing—nonfiction, poetry and fiction are all important—or rhetoric or linguistics or all of these. Their literary study should emphasize a range of close reading experiences in different kinds of literature, as well as the methods for exploring a literary text. Especially, they should remember the importance of a broad educational experience for their own study and as a basis for understanding the interests of their students. Finally, they should remember that an undergraduate degree represents minimal training for good teachers, so they should plan a program which will permit graduate study at a later time.

English majors who are working for teacher certification must devote one semester of the senior year to professional training apart from coursework in the English Department.

The Department also participates in a joint major in English and elementary education. Those interested in such a program should consult their advisers in elementary education.

Students who seek certification for secondary teaching in fields other than English may seek minor certification in English. Such certification is particularly appropriate for students majoring in speech or journalism. Such a student must complete 20 semester hours of English, excluding freshman courses in rhetoric, speech, or writing. The program must include a course in each of these areas: advanced composition, Shakespeare, American literature and British literature of the 19th or 20th centuries. In addition to the 20 semester hours of English, the student is required to take Methods in Teaching High School English in the College of Education. While this program meets minimum requirements for certification, the Department believes that anyone desiring to teach English should have considerably more training in the field.

Sloan Summer Scholarships

Two $1,500 Sloan Scholarships are available to University of Iowa English majors for study at a university in the British Isles during the summer following the recipient's junior year. Applications must be submitted to the professor in charge of the scholarship committee not later than February 25 for the following summer. The application must include a list of the English courses the applicant has completed, a statement of the applicant's reasons for wishing to study abroad, and a paper he or she has completed for a University of Iowa English course, including the instructor's comments.

Graduate Programs

Master of Arts

The aims of the Master of Arts program are much the same as those of the undergraduate programs, except, of course, that the M.A. program is more demanding. It prepares students to teach English in high schools and community colleges, or to continue advanced study as candidates for the doctoral degree. Some students undertake the M.A. program for general personal development.

The program requires at least 30 semester hours of graduate credit, at least 24 of which must be earned in residence; one departmental seminar with at least a "B" grade; and satisfactory performance in a four-hour written examination covering a prescribed reading list.

Students admitted to Ph.D. candidacy may qualify for the M.A. degree by satisfying the foreign language requirements for the Ph.D., completing at least 45 semester hours of graduate coursework with at least a 3.25 grade-point average and performing satisfactorily on a master's examination.

Master of Arts with Emphasis in Expository Writing

This program emphasizes the theory, analysis, practice and teaching of expository

writing. It is designed to meet the needs of students who wish to become teachers or critics of expository writing, students who wish to become professional writers, or students who have no specific career objectives but still wish to improve their writing and to pursue a course of study that will help them to understand the nature and practice of expository writing.

To qualify for the M.A. with emphasis in expository writing, a student must complete 30 semester hours of graduate work with a grade-point average no lower than 3.00. At least 24 of these hours must be earned in residence, including 9 hours of work in advanced composition at Iowa with a grade of "B" or "A".

In conjunction with an adviser, the student must plan a coherent program of study to be completed before the degree is awarded. This plan must be approved by an advisory committee which will ensure that the assumptions of the program in expository writing are manifest in each student's program.

Finally, the student must submit to his or her committee a proposal for a thesis, which will be an extended piece of expository writing; must pass an oral examination in defense of the project; and must receive the committee's approval of the completed thesis.

Work on the thesis may not be counted toward the required 30 hours of graduate work. Students interested in this program should consult the Director of Advanced Writing.

Master of Arts and Specialist in Education

This is a two-year, 60-hour program for students who wish to prepare for teaching in community colleges. The program includes three hours in linguistics, 12 in literature, six in advanced writing and 24 in professional courses taught by specialists in English and in education. Each student spends one semester interning in a community college.

Master of Fine Arts

The purpose of the Master of Fine Arts program is to provide professional guidance and a stimulating environment for students with previous achievement or notable promise in translations, poetry, fiction or plays. The requirements are flexible, but usually include 48 semester hours of graduate credit, earned chiefly in the Writers Workshop; a book-length collection of poems or short stories, a novel, a play, or a work of creative writing in some other appropriate form; and satisfactory performance on an examination on modern literature in the form the student is employing.

Master of Fine Arts with Emphasis in Translation

This alternative to the M.F.A. in Creative Writing emphasizes the discipline of translation, viewed as a distinct literary genre. Student programs are individually structured, and are designed to develop skills in source and target languages and cultures. The course also seeks to develop awareness of the tradition of translation and the history of translation theory. The program normally requires 48 semester hours of graduate credit, including a minimum of 12 hours of Translation Workshop, a collection of translated poetry, fiction, or drama, and an examination in practical criticism involving problems of translation.

Doctor of Philosophy

Since most doctoral graduates enter college and university teaching, the Department attempts to prepare Ph.D. candidates for the teaching, publication and service required of faculty members. The doctorate requires 72 semester hours of graduate credit, of which at least 30 must be earned in residence at Iowa. Within specified limits, the program may be accommodated to the student's special needs and interests. For example, concentrations are possible in areas of literary history, literary criticism, writing, rhetorical theory and stylistics, folklore, bibliography, pedagogy, comparative literature and linguistics.

The Department also offers the Ph.D. with a concentration in modern letters, which provides the student an opportunity to focus part of his work on an interdisciplinary area. The term "interdisciplinary" may be interpreted broadly to mean a study of another foreign literature, film, drama, or study of contemporary culture.

The requirements specified by the English Department include formal admission to candidacy by a vote of the full faculty; demonstration of a high level of competence in two foreign languages and their literatures, or mastery of a single foreign language and its literature; distributed coursework, depending upon needs, in historical areas, criticism and linguistics; two seminars; a part-written, part-oral comprehensive examination in three areas, two of which are usually historical periods of English and American literature; a dissertation, which may be either a scholarly work or a piece of imaginative writing; and a final examination in defense of the dissertation. All doctoral candidates are required to gain teaching experience, preferably in the Rhetoric and Literature Core programs of the College of Liberal Arts.

Interested students should write to the Director of Financial Aids and Doctoral Admissions in English for more detailed explanations.

Financial Aid

Aid is available to graduate students in the form of scholarships, fellowships and teaching and research assistantships. It is awarded on a competitive basis to the best qualified applicants, without regard to need, race, sex or other nonqualitative criteria. Since sources are limited, normally fewer than half the applicants for aid receive it. New students are at something of a disadvantage, and should expect to support themselves through the first year. Applications are considered only from students who have been admitted to the Graduate College. Applications and all necessary supporting material must be submitted by February 15 for the following fall semester. Forms are available from the Department and the University Office of Admissions.

Admission

All applicants for admission to any graduate program in English must meet the general requirements for admission to the Graduate College, and must submit at least two letters in support of their admission. In addition, M.F.A. applicants should submit samples of their poetry or fiction to the director of the Creative Writing Program, and Ph.D. applicants should submit a representative sample of their writing—a course paper, seminar paper or thesis chapter—to the Department's associate director of graduate study.

Writing Programs

For the past fifty years, Iowa has exercised strong national leadership in virtually all areas of the teaching of writing. It was the first institution, in 1922, to accept creative dissertations for advanced degree programs.

Founded in 1936, the Writers Workshop was a pioneer venture in the field of creative writing and numbers scores of distinguished poets and novelists among its alumni. The Workshop provides opportunities for students at all levels to work with outstanding teacher-authors, and also brings numerous prominent authors to campus each year for lectures and readings.

The International Writing Program, founded in 1966, brings numbers of prominent foreign writers to campus each year, and has added a unique dimension to the opportunities available to students in the area.

Iowa has also been a leader in the area of expository writing and rhetorical theory, and is one of the few academic institutions in the nation which offers a full range of graduate coursework in this area.

Beginning in the spring of 1979, The University of Iowa will be conducting an Institute on Writing, a project for the professional development of college and university directors of freshman writing programs. The Institute is a five-year project, jointly funded by the National Endowment for the Humanities and the University. The presence of the Institute will serve to expand the resources available to students in the area of writing, and will enable the department to bring distinguished instructors to campus to participate in regular course offerings in writing.

Special Facilities

The University Library is strong in all areas of English and American literature, and is especially noteworthy for its collection of American periodicals and its holdings in 19th and 20th century works.

The Department provides a wealth of opportunities for student involvement in critical, scholarly, and creative publications. *The Iowa Journal of Literary Studies* is a quarterly publication edited by graduate students, in which the emphasis is on featuring the creative and scholarly work of students in English and related areas. Opportunities are also available for editorial experience through the *Iowa Review*, *Philological Quarterly*, and the Windhover Press.

Students are welcome to participate in the activities of the English Graduate Student Society, the Humanities Society, the Friends of Old-Time Music, and the Midwest Modern Language Association. Visiting writers and lecturers are on the campus almost every week, and periodic conferences and literary "festivals" enliven the routine of classwork.

Courses

Individual descriptions for the English courses listed below are not included because the content and emphasis of many courses varies considerably from one semester to another. Detailed course descriptions for all offerings in a given semester are available in the English Department office well in advance of the beginning of each semester.

For Undergraduates

Lecture courses open to all undergraduates who have satisfied the Rhetoric requirement:

8:1 Modern Fiction 3-4 s.h.

8:2 Modern Poetry 3-4 s.h.

8:3 Modern Drama 3-4 s.h.
Same as 36T:61.

8:8 Classical and Biblical Literature 3-4 s.h.

8:9 Shakespeare 3-4 s.h.
Same as 36T:9.

8:10 Introduction to Film Analysis 3 s.h.
Same as 36B:40.

Introductory Courses in Close Reading of Texts

Limited-enrollment discussion courses in which a small number of texts are read carefully to illustrate representative problems in interpreting and evaluating literature:

8:20 Critical Approaches to Literary Works 3 s.h.

8:51 Major British and American Poets I 3 s.h.

8:52 Major British and American Poets II 3 s.h.

8:53 Selected Plays 3 s.h.
Same as 36T:62.

8:54 Selected Films 3 s.h.
Same as 36B:54.

8:55 Selected Essays 3 s.h.

8:56 American Literary Classics 3 s.h.

8:60 Selected Works of the Middle Ages 3 s.h.

8:61 Selected Works of the Renaissance 3 s.h.

8:62 Selected Works of the 18th Century 3 s.h.

8:63 Selected Works of the 19th Century 3 s.h.

8:64 Selected American Works Before 1900 3 s.h.

8:65 Selected Early Modern Works 3 s.h.

8:66 Selected Works of the 20th Century 3 s.h.

Major Authors Courses

Limited-enrollment discussion courses. Each author is represented by several major works. Combinations of authors are changed regularly. By permission of the instructor, a student may repeat registration for same course number if authors have been changed:

8:71 Chaucer 3 s.h.

8:72 Shakespeare 3 s.h.
Same as 36T:13.

8:73 Selected English Authors 3 s.h.

8:74 Selected American Authors 3 s.h.

8:75 Selected English and American Authors 3 s.h.

8:76 Selected Modern Authors 3 s.h.

8:77 Selected Authors 2-3 s.h.

Literature Semester Courses

Limited-enrollment, team-taught discussion courses emphasizing the reading of whole texts (see separate departmental announcements). Literature Semester I (8:80-83) satisfies requirements of the major for literature before 1800. Students should have taken at least one college-level literature course before registering for either of these courses. Preregistration is required.

8:80 English Literature Before 1900 3 s.h.

8:81 English Literature Before 1900 3 s.h.

8:82 English Literature Before 1900 3 s.h.

8:83 English Literature Before 1900 3 s.h.

8:84 American and Contemporary Literature 3 s.h.

8:85 American and Contemporary Literature 3 s.h.

8:86 American and Contemporary Literature 3 s.h.

8:87 American and Contemporary Literature 3 s.h.

Seminars for Undergraduate Majors

Enrollment limited to undergraduate English majors and to others by special permission of the instructor:

8:98 Honors Proseminar 3 s.h.

8:99 Undergraduate Seminar 3 s.h.

For Undergraduate and Graduate Students

Literature and Culture Courses

Primarily for upperclassmen and beginning graduate students, these lecture courses are designed to exhibit major works and authors within the context of the social, political, intellectual and artistic movements of their time; literary history is the basic part of the work, but the main goal is to show literature in the whole context of contemporary intellectual life. Students who have established backgrounds in history or related arts are especially welcome. Undergraduate majors in English are urged to include at least one course of this type in the latter half of their majors:

8:100 Introduction to Critical Problems 3 s.h.

8:101 Literature and Culture of the Middle Ages 3-6 s.h.

8:102 Literature and the Culture of the Renaissance 3-6 s.h.

8:103 Literature and the Culture of 18th-Century England 3-6 s.h.

8:104 Literature and the Culture of 19th-Century England 3-6 s.h.

8:105 Literature and Culture of 19th-Century America 3-6 s.h.

8:106 Literature and the Culture of 20th-Century America 3-6 s.h.

8:107 American Criticism and Culture 1900 to Present 3-4 s.h.

8:108 American Literature and Civilization 3 s.h.

8:109 European Literature of the 19th Century 3 s.h.
Same as 48:106 and 106:110.

8:110 Selected Authors 3 s.h.

8:111 American Folk Literature 3 s.h.

8:112 American Jewish Writers 3 s.h.

8:113 American Indian Literature 3 s.h.

8:114 American Regional Literatures 3 s.h.

8:115 Literature of Iowa 2-3 s.h.

8:116 Afro-American Literature I 3 s.h.
Same as 45:116.

8:117 Afro-American Literature II 3 s.h.
Same as 45:117.

8:118 Chicano Literature 2-3 s.h.
Same as 35:127, 106:127.

8:119 African Literature 3 s.h.
Same as 45:119, 106:119.

8:126 Literary Genres in European Literature II 3 s.h.
Same as 48:115 and 106:126.

8:141 Literature and Culture of America Before 1800 4-6 s.h.
Same as 45:141.

8:156 Literature and Culture of the 17th Century 3-6 s.h.

8:164 Literature and Culture of the 20th Century 3-4 s.h.

8:186 Comparative Perspectives on American Culture 3 s.h.
Same as 45:186.

8:190 Augustine to Romance of the Rose 3 s.h.

8:192 Dante and Romance Poetry 3 s.h.
Same as 48:192, 106:192.

8:193 Celtic and Norse in Translation 3 s.h.

Literary Genre Courses

Limited to the discussion of a single genre, and usually further restricted to a limited era and nation; these lecture or large discussion courses are appropriate for any upperclassman or graduate student interested in the area:

Poetry

8:120 Chaucer 2-3 s.h.

8:121 British Poetry 3 s.h.

8:123 Milton 2-3 s.h.

8:124 American Poetry 2-3 s.h.

8:125 Modern British and American Poetry 3 s.h.

8:127 Contemporary Scene in Poetry 3 s.h.
Same as 106:125, 48:127.

8:128 Selected Modern Poets 3 s.h.

48:129 English and Scottish Ballads 3 s.h.

8:159 Studies in the Poetry of Afro-Americans 3 s.h.
Same as 45:177.

Fiction

8:130 20th Century Afro-American Fiction 3 s.h.

8:131 The Narrative Tradition 3 s.h.

8:132 The English Novel: Defoe to Austen 3 s.h.

8:133 English Novel: Scott to Butler 3 s.h.

8:134 American Novel to 1900 3 s.h.

8:135 American Novel since 1900 2-3 s.h.

8:136 American Short Story 2-3 s.h.

8:137 American Humor and Satire 2-3 s.h.

8:138 The European Novel 1700-1850 3 s.h.
Same as 106:138.

8:139 The European Novel 1850 to Present 3 s.h.
Same as 106:106.

8:140 Contemporary Scene in Fiction 3 s.h.
Same as 48:140.

8:142 Popular Literatures 3 s.h.

8:152 Studies in the Fiction of Afro-Americans 3 s.h.

8:191 Literature of Our Times: Prose 2-3 s.h.

Drama

8:122 Shakespeare 2-3 s.h.
Same as 36T:172.

8:143 Selected Dramatists 2-3 s.h.
Same as 36T:143.

8:144 Medieval Drama 3 s.h.
Same as 36T:171.

8:145 English Renaissance Drama 3 s.h.
Same as 36T:179.

8:146 Restoration Drama 3 s.h.
Same as 36T:173.

8:147 English Drama of the 18th Century 3 s.h.
Same as 36T:174.

8:148 Modern Drama Ibsen to Shaw 3 s.h.
Same as 36T:177.

8:149 Selected Modern Dramatists II 3 s.h.
Same as 36T:178.

8:150 Modern American Drama 3 s.h.
Same as 36T:180.

8:154 Afro-American Drama 3 s.h.
Same as 45:180, 36T:186.

8:159 Continental Drama 1700-1850 3 s.h.
Same as 106:176, 36T:176.

8:165 Continental Drama 1500-1700 3 s.h.
Same as 36T:175, 106:165.

8:167 Principles of Drama 3 s.h.
Same as 36T:182.

8:168 Studies in Modern Drama 3 s.h.

Non-Fiction Prose

8:155 The Tradition of the Essay 3 s.h.

8:157 Biography and Autobiography 3 s.h.

8:158 Survey of Non-Fiction Prose 3 s.h.

Thematic Studies

8:160 Selected Themes in Literary Works 3 s.h.

8:161 Women in Literature 2-3 s.h.

8:162 Literature of Peace and War 3 s.h.

8:163 Uses of Utopian Literature 3 s.h.

8:166 Concepts of Love in Western Literature 3 s.h.

8:169 Changing Concepts of Women in Literature 3 s.h.

Interdisciplinary Courses

8:94 Language, Literature, and Medicine 3 s.h.
Same as 106:94.

8:151 Literature and Anthropology 3 s.h.
Same as 48:151, 106:157, 113:109.

8:170 Poetry and Related Art Forms 3 s.h.

8:171 Drama and Related Art Forms 3 s.h.
Same as 36B:156.

8:172 Narrative and Related Art Forms 3 s.h.
Same as 36B:158, 106:191.

8:173 Literature and the Film 2-3 s.h.
Same as 36B:155, 106:173.

8:174 Film Script Analysis 3 s.h.

8:175 Literature and Psychology 3 s.h.
Same as 48:167, 106:167.

8:176 Literature and Philosophic Thought 2-3 s.h.

8:177 Literature and Art 3 s.h.
Same as 48:177.

8:178 Literature and Science 2-3 s.h.

8:179 Literature and Society 3 s.h.
Same as 106:150, 48:150.

8:180 Literature and Music 3 s.h.

8:195 Non-Fiction Prose and Non-Fiction Film 4-6 s.h.

Printing and Design Courses

8:187 The Hand-Printed Book: Problems in Design arr.

8:189 Medieval Manuscripts and Handwriting 3 s.h.

8:203 History of the Book 3 s.h.
Same as 19:215, 21:223.

Independent Study Courses

8:198 Undergraduate Honors Project arr.

8:199 Special Project for Undergraduates arr.

For Graduates

Introduction to Graduate Study

8:200 Bibliography and Research Methods 3 s.h.

8:201 Critical and Scholarly Approaches to Literature 6 s.h.

8:204 Literary Interpretations arr.

Medieval Languages and Literatures

8:211 Old English: Beowulf 3 s.h.

8:212 Old English Literature Excluding Beowulf 3 s.h.

8:213 Early Modern English Language and Literature 3 s.h.
Same as 103:245.

8:215 Middle English Poetry and Prose 3 s.h.

8:216 Celtic Literature 3 s.h.

8:217 Precursors of the Renaissance 3 s.h.

8:218 Old Norse 3 s.h.

Literary Period Courses

8:219 Early Renaissance Literature 3 s.h.

8:220 Renaissance Literature 3 s.h.

8:221 17th-Century Literature 3 s.h.

8:222 Neoclassical Literature 3 s.h.

8:223 Romantic Literature 3 s.h.

8:224 Early Victorian Literature 3 s.h.

8:225 Late Victorian and Edwardian Literature 3 s.h.

8:226 British Literature: 1914-1945 3 s.h.

8:227 Literary History of the United States I 3 s.h.

8:228 Literary History of the United States II 3 s.h.

8:231 Early American Literature 3 s.h.

8:232 American Romantic Literature 3 s.h.

8:233 American Realistic Literature 3 s.h.

8:234 Early 20th-Century American Literature 3 s.h.

8:235 Contemporary American Literature 3 s.h.

8:243 18th-Century Satire 3 s.h.

8:244 Augustan Studies: History and Literature 3 s.h.
Same as 16:224.

8:245 Modern Literature and Its Backgrounds 3 s.h.

Authors Courses

8:251 Chaucer 3 s.h.

8:252 Shakespeare: Early Plays 2-3 s.h.
Same as 36T:212.

8:253 Shakespeare: Later Plays 3 s.h.
Same as 36T:213.

8:254 Milton 3 s.h.

8:256 Selected Authors 3 s.h.

Literary Criticism Courses

8:261 History of Criticism: Plato to 1700 3 s.h.
Same as 48:261, 36T:417.

8:262 History of Criticism: 1700 to 1950 3 s.h.
Same as 48:262, 36T:418.

8:263 Issues in Contemporary Literary Criticism 3 s.h.
Same as 48:263.

8:264 Issues in the History of Criticism 3 s.h.

8:265 Dramatic Theory I 2-3 s.h.

8:266 Dramatic Theory II 2-3 s.h.

8:267 Classical Rhetoric 2-4 s.h.
Same as 36R:301.

8:268 Renaissance and Modern Rhetoric 2-4 s.h.
Same as 36R:302.

8:269 Contemporary Rhetoric 2-4 s.h.
Same as 36R:303.

8:270 Introduction to Modern Literary Criticism 3 s.h.

Literary Modes Courses

8:271 The Tragic Mode 3 s.h.

8:272 The Comic Mode 3 s.h.

8:273 The Ironic Mode 3 s.h.

8:274 Poetic Modes 3 s.h.

8:275 Dramatic Modes 3 s.h.

8:276 Narrative Modes 3 s.h.
Same as 48:276, 9:265.

8:277 Rhetorical Modes 3 s.h.

8:278 Theory and Technique of Oral Literature arr.
Same as 48:278.

Special Period Studies Courses

8:301 Medieval Studies arr.

8:303 Renaissance Studies arr.

8:305 Neoclassical Studies arr.

8:307 Romantic Studies arr.

8:309 Victorian Studies arr.

8:311 American Studies arr.

8:312 Advanced Readings in Black Culture arr.
Same as 45:212, 48:312.

8:313 Modern Studies arr.

8:315 Inter-Period Studies arr.

8:320 Medieval Theories of Poetry and Criticism arr.

Literary Criticism Courses

8:321 Historical Criticism and the Study of Literary Periods arr.
Same as 48:321.

8:322 Intellectual Backgrounds of Literary Periods 2-3 s.h.

8:323 Literary Genres and Modes 3 s.h.

8:325 Poetic Theory and Criticism 3 s.h.

8:327 Dramatic Theory and Criticism 3 s.h.

8:328 Theory and Analysis of Literary Forms 3 s.h.

8:329 American Criticism and Culture 3 s.h.

Comparative and European Literature

8:373 European Renaissance 3 s.h.
Same as 48:373.

8:374 Baroque Neoclassicism 3 s.h.
Same as 48:374.

8:375 Age of Enlightenment 3 s.h.
Same as 48:375.

8:376 European Romanticism 3 s.h.
Same as 48:376.

8:377 Recent European Poetry 3 s.h.
Same as 48:377.

8:380 Intellectual Backgrounds of Literary Periods 3 s.h.
Same as 48:380.

8:381 Movements in European Literature 3 s.h.
Same as 48:381.

8:382 Literary Genres and Modes 3 s.h.
Same as 48:382.

8:383 Patterns of Myth and Literary Forms 3 s.h.
Same as 48:383.

8:384 Types of Modern Criticism 2-3 s.h.
Same as 48:384.

Graduate Seminars

These seminars represent the most advanced work in English and American literature and in related disciplines. The concentration of a given seminar may vary from semester to semester. Permission of the instructor is required for registration.

8:402 Seminar: Medieval Literature arr.

8:404 Seminar: Chaucer arr.

8:405 Seminar: Renaissance Non-Dramatic Literature arr.

8:411 Seminar: Shakespeare arr.

8:412 Seminar: 17th-Century Non-Dramatic Literature arr.

8:414 Seminar: 17th-Century Dramatic Literature arr.

8:421 Seminar: Neoclassical Prose arr.

8:422 Seminar: Neoclassical Poetry arr.

8:431 Seminar: English Romanticism arr.

8:432 Seminar: Victorian Literature arr.

8:433 Seminar: 19th-Century British Literature arr.

8:434 Seminar: 20th-Century British Literature arr.

8:435 Seminar: 20th-Century British and American Literature arr.

8:441 Seminar: American Colonial Literature arr.

8:443 Seminar: American Transcendentalism arr.

8:445 Seminar: American Romantic Literature of the 19th Century arr.

8:446 Seminar: 19th-Century American Literature arr.

8:447 Seminar: American Realistic Literature of the 19th Century arr.

8:450 Seminar: Modern Letters 3 s.h.

8:458 Seminar: American Writers of the 20th Century arr.

8:460 Seminar: Problems in Aesthetics and Literary Theory arr.
Same as 48:460.

8:461 Seminar: Studies in the History of Criticism arr.

8:462 Seminar: Studies in Literary History arr.

8:463 Seminar: Literary Relations arr.
Same as 48:463, 36T:463.

8:465 Seminar: Literature and Other Disciplines arr.
Same as 45:465.

8:466 Seminar: American Criticism and Culture arr.

8:472 Seminar: Literature and Communication arr.
Same as 48:472.

8:490 Seminar: Analytical Bibliography and Textual Criticism arr.

Independent Study

Advanced Studies

Courses for one or several students reading under the guidance of a faculty member:

8:500 Advanced Studies in an Author arr.

8:505 Advanced Studies in a Literary Period arr.

8:510 Advanced Studies in a Literary Form arr.

8:515 Advanced Studies in a Literary Genre arr.

8:520 Advanced Studies in a Literary Mode arr.

8:525 Advanced Studies in a Literary Movement arr.

8:530 Advanced Studies in a Literary Theme arr.

8:535 Advanced Studies in Literary Criticism arr.

8:545 Advanced Studies in Rhetoric arr.

8:550 Advanced Studies in an Interdisciplinary Subject arr.

8:590 Special Project for Grad Students arr.

Dissertation

8:595 Ph.D. Thesis arr.

Linguistics and Language Courses

8L:20 Elements of Linguistics 3 s.h.
Same as 103:20, 122:60.

8L:100 Introduction to Linguistics 3 s.h.
Same as 103:100, 122:101.

8L:114 Language Data Processing 3 s.h.
Same as 103:114.

8L:115 Language Data Programming 3 s.h.
Same as 103:115.

8L:120 Historical and Comparative Linguistics 3 s.h.
Same as 103:120.

8L:131 History of the English Language 3 s.h.
Same as 103:131.

8L:132 Elementary Old English 3-4 s.h.
Same as 103:132.

8L:141 The Structure of English 3 s.h.
Same as 103:141.

8L:142 Modern English Grammar 2-3 s.h.
Same as 103:142.

8L:159 Language, Society, and Education 3 s.h.
Same as 103:105.

8L:164 Historical Backgrounds of Modern English 3 s.h.

8L:181 Linguistic Perspectives 3 s.h.
Same as 103:181.

8L:196 Celtic 3-4 s.h.

8L:198 Old Norse 3-4 s.h.
Same as 103:251.

8L:214 Middle English Language and Literature 3 s.h.
Same as 103:240.

8L:500 Advanced Studies in Linguistics arr.

Professional Courses

Although open to all graduate students, the primary purpose of these courses is to offer theoretical and practical training to those who plan to teach:

8P:20 Advanced Reading Comprehension 1 s.h.

8P:30 Speeded Reading 1 s.h.

8P:40 Practical College Vocabulary 1 s.h.

8P:190 Methods English 3, 6 s.h.
Same as 7S:115.

8P:198 Literature for Adolescents 3 s.h.
Same as 21:193 and 7S:193.

8P:210 Practicum: Teaching Composition 2 s.h.

8P:220 Practicum: Teaching Literature 2 s.h.

8P:310 Teaching Literature in the Two-Year College 2 s.h.

8P:320 Colloquium: English in the Two-Year College 2 s.h.

8P:325 Seminar: English in the Two-Year College 2 s.h.

8P:370 Teaching in a Reading Laboratory 3 s.h.

8P:375 Teaching in a Writing Laboratory 3 s.h.

8P:405 M.A. Seminar: English Education arr.
Same as 7S:315.

8P:425 Ph.D. Seminar: English Education arr.
Same as 7S:415.

8P:450 Colloquium: Teaching Freshman Rhetoric arr.
Same as 36:250.

8P:460 Colloquium: Teaching of Freshman Composition 2-3 s.h.

8P:470 Colloquium: Teaching of Literature in College arr.

Expository Writing Courses

General Interest Courses

These courses are designed to serve the general interests and needs of undergraduates and graduates in all areas of the University. They offer practice in various elements of composition and various kinds of informative, persuasive, and expressive writing.

8W:10 Expository Writing 2-3 s.h.

8W:12 Theories of Rhetoric 3 s.h.

8W:15 Technical and Scientific Writing 2 s.h.

8W:100 Traditional Grammar and Logic 3 s.h.

8W:101 Greek and Latin for Vocabulary Building 2 s.h.
Same as 20:101.

8W:105 Writing for Personal and Public Purposes 3 s.h.

8W:109 Advanced Expository Writing 2-3 s.h.

Special Interest Courses

These courses are designed to serve the special interests and needs of advanced undergraduates and graduates in particular academic and professional areas of the University. They offer practice in specialized forms of writing for specialized purposes and audiences.

8W:111 Writing for the Humanities 3 s.h.

8W:112 Writing for the Sciences 3 s.h.

8W:113 Writing for Business and Industry 3 s.h.

8W:130 Extended Prose: New Journalistic Writing 3 s.h.

8W:131 Forms of Writing 3 s.h.

8W:158 Free-Lance Writing 3 s.h.
Same as 19:148.

8W:159 Free-Lance Workshop 3 s.h.
Same as 19:147.

8W:199 Undergrad Project in Expository Writing arr.

8W:290 Critical Writing arr.

8W:390 Scholarly Writing Workshop arr.

Theory and Practice Courses

These courses are designed to serve the interests and needs of advanced undergraduates and graduates who aim to become not only practitioners, but also critics or teachers of expository writing. They combine theory and analysis of expository writing with practical experimentation in writing.

8W:137 Prose Style: Analysis and Imitation 3 s.h.

8W:138 The Art of the Essay 3 s.h.

8W:141 Approaches to the Teaching of High School Writing 3 s.h.

8W:238 Philosophy of Language and the Nature of Writing 3 s.h.

8W:239 Rhetorical Theory Analysis and Application 3 s.h.

8W:240 Theories of Writing 2-3 s.h.

8W:241 Approaches to Teaching College Writing 3 s.h.

8W:475 Seminar: Problems in Rhetoric arr.

8W:550 Special Project in Expository Writing arr.

Creative Writing Courses

General Interest Courses

These courses are designed to serve the general interests and needs of undergraduate and graduate students in all areas of the University. Thus they offer practice in various elements and forms of creative writing.

8W:23 Creative Writing 3 s.h.

8W:116 History and Theory of Translation 3 s.h.
Same as 48:116, 106:116.

8W:151 Fiction Writing arr.

8W:152 Poetry Writing arr.

8W:155 Basic Playwriting 3 s.h.
Same as 36T:155.

8W:156 Playwriting II 3 s.h.

8W:161 Fiction Writing Advanced arr.

Professional Workshop Courses

These courses are designed to serve special needs and interests of undergraduate and graduate students who have substantial background and experience in a specific area of creative writing. Thus they are open only to students who have received permission of the instructor or who have been admitted to work in the Writers Workshop.

8W:85 Undergraduate Writers Workshop: Fiction arr.

8W:86 Undergraduate Writers Workshop: Poetry arr.

8W:157 Playwrights Workshop Same as 36T:157.	3 s.h.
8W:251 Fiction Workshop	arr.
8W:252 Poetry Workshop	arr.
8W:260 Translation Workshop Same as 48:260.	arr.
8W:265 International Literature Seminar	arr.
8W:270 Form of Fiction	3 s.h.
8W:275 Form of Poetry	3 s.h.
8W:490 Seminar: Problems in Modern Fiction	arr.
8W:495 Seminar: Problems in Modern Poetry	arr.

Independent Study

8W:110 Correction and Evaluation of High School Writing	2 s.h.
8W:195 Undergraduate Project in Creative Writing	arr.
8W:555 Graduate Project in Creative Writing	arr.
8W:590 MFA Thesis	arr.

French and Italian

Department Chair: John T. Nothnagle, Jr.
Faculty: *professors* Florindo V. Correta, Jessie L. Hornsby, John T. Nothnagle, Richard O'Gorman
associate professors Charles F. Altman, Jacques A. Bourgeacq, Marguerite Iknayan, Pierre de Saint Victor, Simone Szertics
assistant professors Janet G. Altman, Wendy Deutelbaum, Geoffrey Hope, Steven Ungar
Degrees offered: B.A. (French or Italian), M.A. (French), Ph.D. (French)

Undergraduate Programs

The Department offers a variety of major programs in French and Italian, electives for nonmajors with prerequisite linguistic skills and flexible means to meet the formal language requirements of the College of Liberal Arts and to satisfy individual needs and interests.

The Department's purpose is to introduce students to the culture of countries of historical and contemporary importance, facilitate the development of proficiency in the language and foster critical appreciation of the civilization and literature of the country.

Students majoring in French or Italian may combine their studies with courses in education (see "College of Education") to secure jobs in high school teaching. They may continue their studies in graduate school in such areas as French, comparative literature and history as preparation for college-level teaching. Or, in combination with other skills and studies, a major in French or Italian may lead to challenging career opportunities in the international areas of government, business, finance, travel, or communications, where the knowledge of a foreign language is essential.

French

The undergraduate major in French may be completed with an orientation in literature, civilization or teaching. Courses taught in English do not count toward the French major.

The literature program requires a total of 35 semester hours, including:

9:27-28 Second-Year Composition and Conversation	8 s.h.
9:111-112 Third-Year Composition	6 s.h.
9:126 French Conversation: Third Level	2 s.h.
9:136 French Conversation: Fourth Level	2 s.h.
9:175 Advanced French Pronunciation	2 s.h.
or	
9:25 French Pronunciation	2 s.h.

A minimum of four 100-level courses in literature, plus a fifth 100-level course in a choice of literature, advanced language or civilization, totaling 15 semester hours.

The civilization program requires 34-35 semester hours, including:

9:27-28 Second-Year Composition and Conversation	8 s.h.
9:111 Third-Year Composition	3 s.h.

A choice of one from this group:

9:112 Third Year Composition	3 s.h.
9:126 French Conversation: Third Level	2 s.h.
9:136 French Conversation: Fourth Level	2 s.h.

A minimum of four 100-level courses in French civilization and three 100-level courses in literature totaling 21 semester hours.

The teaching major requires 35 semester hours, including:

9:27-28 Second-Year Composition and Conversation	8 s.h.
9:111-112 Third-Year Composition	6 s.h.
9:175 Advanced French Pronunciation	2 s.h.
9:126 French Conversation: Third level	2 s.h.
9:136 French Conversation: Fourth level	2 s.h.

A minimum of five 100-level courses, of which at least two are in literature and two in civilization, totaling 15 semester hours.

The student in a teaching major must also complete the requirements of the College of Education for certification.

Italian

Requirements for the major in Italian include:

18:11-12 Intermediate Italian	6 s.h.
18:111-112 Advanced Composition and Conversation	8 s.h.
18:105-106 Introduction to Italian Literature	6 s.h.
18:119-120 Dante and His Times	6 s.h.
18:101 Literature of the 19th Century	3 s.h.
or	
18:102 Literature of the 20th Century	3 s.h.
Total	27 s.h.

Honors

The Department participates in the College of Liberal Arts Honors Program, which provides enrichment opportunities for qualified students.

Summer Program in France

The Department is cosponsor of a Summer Program in France for students enrolled in the three Iowa Regents universities. Eligibility for the program requires a good basic knowledge of French (two years of college-level preparation is recommended), but does not require that the student be a French major. Centered in Rouen and Paris, the eight-week program combines formal class work in language skills with an integrated course in the culture and civilization of France, with visits to points of cultural and historical interest. Students may earn up to nine semester hours of credit in the program.

Graduate Programs

Master of Arts

Three different programs are offered leading to the Master of Arts degree in French. For some students this may be a terminal degree, for others a step toward the doctorate. The plan of study should therefore correspond to the candidate's objectives. Students will consult with the departmental director of graduate studies and their advisory committees in determining a plan of study.

Master of Arts without Thesis

This program requires a minimum of 30 semester hours and the passing of a written and oral examination. The program must include 9:175 Advanced French Pronunciation, 9:209 Advanced Grammar and Lexicology, 9:210 Comparative Stylistics, and at least four graduate-level (200 and above) literature courses. With the permission of the departmental executive officer, the candidate may take up to six of the required 30 hours outside the Department.

Master of Arts with Thesis

The requirements for the thesis program are the same as for the M.A. without thesis, except that in the thesis program the candidate may earn up to six semester hours' credit for the thesis, which will be defended at the time of the comprehensive examination.

Master of Arts in French Education

This program is intended primarily for prospective secondary and junior college teachers. Requirements include a total of 38 semester hours at the advanced level, of which 8 must be taken in education or related fields and at least 9 must be in graduate courses in French literature.

These courses are also suggested:

9:153 Stylistics: Analysis and Application
9:154 Textual Analysis
9:209 Advanced Grammar and Lexicology
9:210 Comparative Stylistics
9:113-114 French Civilization
9:150 Methods: Foreign Language
9:151 Language Laboratory Equipment Procedures
9:162 Contemporary France
9:175 Advanced French Pronunciation

Candidates must pass a final written and oral examination.

Doctor of Philosophy

The Ph.D. degree in French is awarded after completion of at least three years of graduate study (of which one must be spent in residence at the University), the passing of a comprehensive examination, and the oral defense of a dissertation.

Specific requirements for the Ph.D. in French include:

9:251 Introduction to Old French Grammar;
Proficiency in a foreign language other than French (i.e., four semesters of college study or equivalent);
Completion of three graduate courses (minimum of eight semester hours) in a related field, such as another literature, or history, philosophy, etc.; and
A minimum of six semester hours of credit in 9:277 Thesis.

The choice of second language and field are to be determined by the candidate and adviser in consultation.

Graduate students working toward an advanced degree are required to spend at least one year teaching as graduate assistants in the Department.

Admission

For admission to the M.A. program in French, the applicant must have completed the equivalent of the undergraduate major in French. Deficiencies in previous training may be removed by taking appropriate courses.

It has been the practice of the Department to require that doctoral candidates first earn the M.A. degree in French. Successful completion of the M.A. program does not necessarily qualify a student for doctoral studies. For students earning the M.A. at The University of Iowa, the M.A. comprehensive examination committee will make a recommendation concerning admission to the Ph.D. program. Students applying for doctoral candidacy with the M.A. earned at another institution are, when admitted, placed on conditional status and this status is reviewed after one semester of residence.

In addition to the Graduate Record Examination scores required by the Graduate College, the Department requires of all candidates the GRE Advanced Test in French.

Appointments

Teaching and research assistantships and University fellowships and scholarships are available to qualified graduate students (see "Graduate College"). The Department may name one Teaching/Research Fellow annually. Inquiries should be addressed to the departmental office.

Exchange assistantship agreements with the French Ministry of Education and the University of Poitiers provide a limited number of graduate students one year of residence in France.

French Courses

Primarily for Undergraduates

Students who have had significant experience with French through study or foreign residence are required to take placement tests.

A student may not repeat, for either credit or quality points, an elementary course if he or she has already completed a higher-level course for which the elementary course or its equivalent is a prerequisite.

9:1 Elementary French 4 s.h.
For students who have no knowledge of French.

9:2 Elementary French 4 s.h.
Prerequisite: 9:1 or equivalent.

9:5 Elementary French Intensive Course 4 s.h.
First-year French in one semester.

9:7 French for Travellers I 2 s.h.
Basic conversational French for the traveller. Given in Saturday and Evening Class Program.

9:8 French for Travellers II 2 s.h.
Continuation of 9:7, with emphasis on practical vocabulary. Given in Saturday and Evening Class Program.

9:9 French Views of America 2 s.h.
Interpretation of life, institutions, etc., of the United States as reported by travellers from France, from Chateaubriand and Tocqueville to contemporary visitors. Given in Saturday and Evening Class Program.

9:10 French Literature of Commitment 4 s.h.
Given entirely in English. May be taken as part of core literature requirement. Same as 11:10.

9:11 Intermediate French 3 s.h.
Recommended for students who plan to terminate their study of French with second year. Prerequisite: 9:2 or equivalent.

9:12 Intermediate French 3 s.h.
Continuation of 9:11. Prerequisite: 9:11 or equivalent.

9:25 French Pronunciation 2 s.h.
May be taken in conjunction with 9:27, 9:28, 9:111, 9:112.

9:26 French Conversation: First Level 2 s.h.
May be taken independently or in conjunction with 9:11, 9:12, 9:27, 9:28. Prerequisite: 9:2 or equivalent.

9:27 Second-Year Composition and Conversation 2, 4 s.h.
Recommended for students who intend to continue study of French or who wish to improve their active command of the language. Prerequisite: 9:2 or equivalent.

9:28 Second-Year Composition and Conversation 4 s.h.
Continuation of 9:27. Prerequisite: 9:27 or equivalent.

9:36 French Conversation Second Level 2 s.h.

9:51 Ph.D. French I 0 s.h.
For candidates for doctorate in other departments who want reading ability for purposes of research.

9:52 Ph.D. French II 0 s.h.

9:53 Ph.D. French III 0 s.h.

9:54 Ph.D. French IV 0 s.h.

9:57 Special Work arr.
Prerequisite: 9:2 or equivalent.

For Undergraduates and Graduates

A detailed description of courses offered each semester is available in the Department office. All courses are given in French unless otherwise indicated. Courses numbered from 150-199 are intended primarily for advanced undergraduates; a graduate student should consult with his or her adviser before registering for these courses. Courses numbered 140-149 are given in English and do not count toward the major requirements in French, but may be taken as electives; consultation with the adviser is recommended prior to registration.

9:100 Regents' Summer Abroad Program 8-9 s.h.
Available only to students participating in the Regents' Summer Program in France.

9:105 Introduction to French Literature 17th-18th Centuries 3 s.h.
Prerequisite: 9:12, 9:28, or equivalent.

9:106 Introduction to French Literature 19th Century 3 s.h.
Prerequisite: 9:12, 9:28, or equivalent.

9:107 Themes in French Literature 3 s.h.
Prerequisite: 9:12, 9:28, or equivalent.

9:108 Introduction to French Literature 20th Century 3 s.h.
Prerequisite: 9:12, 9:28, or equivalent.

9:109 Introduction to French Civilization 4 s.h.

9:111 Third-Year Composition 3 s.h.
Prerequisite: 9:28 or equivalent.

9:112 Third-Year Composition 3 s.h.
Continuation of 9:111. Prerequisite: 9:111 or equivalent.

9:113 French Civilization 3 s.h.
A survey of social history from Middle Ages to 1789.
Prerequisite: 9:12, 9:28, or equivalent.

9:114 French Civilization 3 s.h.
A survey of social history from 1789 to the present.
Prerequisite: 9:12, 9:28, or equivalent.

9:126 French Conversation: Third Level 2 s.h.
Prerequisite: 9:36 or equivalent.

9:136 French Conversation: Fourth Level 2 s.h.

9:140 Studies in the Novel 3 s.h.
The French novelistic tradition through selected major texts and critical theories. Given in English.

9:141 19th-Century French Novel 3-4 s.h.
Given in English.

9:143 20th-Century French Fiction 3 s.h.
Given in English.

9:144 20th-Century French Theatre 3 s.h.
Given in English.

9:145 Masterpieces of French Literature 3 s.h.
Major writers from Middle Ages to 17th century; given in English, readings in French. Prerequisite: 9:12, 9:28, or equivalent.

9:146 Masterpieces of French Literature 3 s.h.
Major writers of the 18th and 19th centuries; given in English, readings in French. Prerequisite: 9:12, 9:28, or equivalent.

9:147 French Cinema 3 s.h.
Same as 36B:147.

9:148 Narrative and Related Art Forms 3 s.h.
Given in English.

9:149 Literature and Psychology 3 s.h.
Given in English.

9:150 Methods: Foreign Language 3 s.h.
Ordinarily elected as 7S:116. Same as 35:130, 20:119, 13:120, 7S:116.

9:151 Language Laboratory Equipment Procedures 1-2 s.h.
Same as 35:131, 7S:124.

9:152 Current Issues, Approaches, and Materials in Foreign Language Education 3 s.h.
Same as 7S:154, 35:177.

9:153 Stylistics: Analysis and Application 3 s.h.
Relationship of linguistic structures and thought processes. Exercises and analyses to develop close reading skills.
Prerequisite: 9:112 or equivalent.

9:154 Textual Analysis 3 s.h.
Study of literary styles through analysis of representative texts. Follows 9:153 but may be taken independently.

9:155 Commercial and Technical Translation 3 s.h.
Methodology of translation with practical exercises in translating commercial and scientific texts. Prerequisite: two years of college French or equivalent, or consent of instructor.

9:156 Translation and Pastiche 3 s.h.
The art of literary translation, imitation, and parody.

9:158 Business French 3 s.h.

9:161 Topics in French Civilization 3 s.h.

9:162 Contemporary France 3 s.h.
Careful study of major aspects of the Fifth Republic.
Prerequisite: 9:113 or equivalent.

9:163 Introduction to the French-Speaking World 3 s.h.
Survey of African and Caribbean literature written in French with focus on Negritude movement. Prerequisite: 9:112 or equivalent. Same as 45:135, 106:184.

9:165 French Civilization Through the Arts 3 s.h.
Prerequisite: 9:112 or equivalent.

9:175 Advanced French Pronunciation 2 s.h.
Required for teachers. Prerequisite: 9:112 or equivalent.

9:177 The French Writer and Social Criticism 3 s.h.
Prerequisite: 9:112 or equivalent.

9:182 Critical Approaches to French Literature 3 s.h.
Prerequisite: 9:112 or equivalent.

9:184 19th-Century Poetry 3 s.h.
Prerequisite: 9:112 or equivalent.

9:186 20th-Century French Poetry 3 s.h.
Prerequisite: 9:112 or equivalent.

9:187 Aspects of Poetry 3 s.h.
Prerequisite: 9:112 or equivalent.

9:188 20th-Century French Drama 3 s.h.
Prerequisite: 9:112 or equivalent.

9:189 The Novel 3 s.h.
Given in French. Prerequisite: 9:112 or equivalent.

9:190 Essayists and Moralists 3 s.h.
Prerequisite: 9:112 or equivalent.

9:191 Heroes and Humanists: Middle Ages and Renaissance 3 s.h.
Prerequisite: 9:112 or equivalent.

9:192 French Classical Literature 3 s.h.
Prerequisite: 9:112 or equivalent.

9:193 French Literature of the Enlightenment 3 s.h.
Prerequisite: 9:112 or equivalent.

9:194 19th-Century French Novel 3 s.h.
Prerequisite: 9:112 or equivalent.

9:195 20th-Century French Novel 3 s.h.
Prerequisite: 9:112 or equivalent.

9:196 Special Work arr.

9:197 Translation Project 3 s.h.

9:198 Honors Readings 3 s.h.
Prerequisite: consent of major adviser.

9:199 Honors Seminar 3 s.h.
Prerequisite: consent of major adviser.

Primarily for Graduates

9:209 Advanced Grammar and Lexicology 3 s.h.
Emphasis on syntax as means of expression. Prerequisite: 9:112 or equivalent.

9:210 Comparative Stylistics 3 s.h.
Exercises in advanced syntax; syntax as literary device.
Prerequisite: 9:209. Same as 48:211.

9:211 Romanticism 3 s.h.

9:212 Realism and Naturalism 3 s.h.

9:213 Eighteenth-Century Fiction 3 s.h.

9:214 Studies in the Enlightenment 3 s.h.

9:215 The Renaissance in France 3 s.h.

9:216 Studies in the Renaissance 3 s.h.

9:218 Symbolism 3 s.h.

9:221 Literature of the 20th Century 3 s.h.
Major themes with attention to interiority and exteriority.

9:222 New Criticism and New Novel 3 s.h.

9:223 Studies in Modern French Drama 3 s.h.

9:224 Modern French Novel 3 s.h.

9:227 Studies in the Seventeenth Century 3 s.h.

9:228 Classical Drama 3 s.h.

9:230 Classical Comedy 3 s.h.

9:232 Literary Movements 3 s.h.
Selected major literary movements in French literature.

9:234 Seminar in Teaching: Grammar 1 s.h.

9:235 Seminar in Teaching: Literature 1 s.h.

9:250 Comparative Romance Linguistics 3 s.h.
Same as 20:201, 35:250, 103:262.

9:251 Introduction to Old French Grammar 3 s.h.

9:252 French Literature to 1180 3 s.h.
Epic and Romance.

9:253 French Literature in Reigns of Philippe Auguste and Saint Louis 3 s.h.

9:254 Literature of the Middle French Period 3 s.h.
Rutebeuf to Villon.

9:256 Language and Literature of Medieval Occitania: Provençal 3 s.h.

9:260 Critical Theory and Practice 3 s.h.

9:265 Narrative Modes 3 s.h.
Same as 8:276, 48:276.

9:277 Thesis arr.

9:279 Special Work arr.

9:302 Seminar Literary Relations arr.

9:351 Seminar in French Civilization 3 s.h.

9:355 Seminar 3 s.h.

9:356 Seminar: Modern Criticism 3 s.h.

9:357 Seminar 3 s.h.

9:358 Seminar 3 s.h.

9:375 Interdepartmental Seminar 0-3 s.h.

Italian Courses

Primarily for Undergraduates

18:1 Elementary Italian 4 s.h.

18:2 Elementary Italian 4 s.h.
Prerequisite: 18:1 or equivalent.

18:11 Intermediate Italian 3 s.h.
Prerequisite: 18:2 or equivalent.

18:12 Intermediate Italian 3 s.h.
Prerequisite: 18:11.

18:13 Conversational Italian 2 s.h.

18:14 Conversational Italian II 2 s.h.

18:53 Special Work arr.

18:111 Advanced Composition and Conversation 4 s.h.
Prerequisite: 18:12 or equivalent.

18:112 Advanced Composition and Conversation 4 s.h.
Prerequisite: 18:111.

For Undergraduates and Graduates

18:101 Literature of the 19th Century 3 s.h.
Given in English.

18:102 Literature of the 20th Century 3 s.h.
Given in English.

18:103 Intensive Italian: Grammar 4 s.h.
Open to undergraduates with a minimum of two years in another foreign language and to graduate students.

18:104 Intensive Italian: Readings 3 s.h.
Prerequisite: 18:103 or equivalent.

18:105 Introduction to Italian Literature 3 s.h.
From earliest writings to end of 16th century; given in English. Prerequisite: 18:12.

18:106 Introduction to Italian Literature 3 s.h.
Continuation of 18:105, but may be taken as an independent unit; from 17th century to present.

18:119 Dante and His Times 3 s.h.
Given in English.

18:120 Dante and His Times 3 s.h.
Given in English.

Primarily for Graduates

18:207 Alberto Moravia and the 20th Century Novel 3 s.h.
Given in Italian.

18:208 Writers of Modern Italy: Silone, Vittorini, Pavese 3 s.h.
Given in Italian.

18:209 Italian Dramatic Literature of the 20th Century 3 s.h.
Given in Italian.

18:216 Petrarch and Early Italian Lyric 3 s.h.
Given in English.

18:217 Literature of the 16th Century 3 s.h.
Given in English.

18:218 Dramatic Theory and Practice of the Renaissance 3 s.h.
Given in English.

18:219 Dante's *Divina Commedia I* 3 s.h.
Given in Italian.

18:220 Dante's *Divina Commedia II* 3 s.h.
Given in Italian.

18:279 Special Work arr.

18:380 Intellectual Backgrounds of Literary Periods arr.

General Science

Coordinator: Robert E. Yager
Degrees offered: B.A., B.S.

The program in General Science enables preprofessional students who need credit in several science disciplines, as well as students interested in a variety of science disciplines, to complete a degree while satisfying preprofessional requirements and/or continuing with courses in multiple science fields. The program provides some depth of preparation while encouraging continual breadth of experiences—a combination attractive for preparation for secondary school teaching, health-related professions including medicine, dentistry, medical technology, optometry, physical therapy, and similar areas, and certain specialized and interdisciplinary graduate areas. There are three categories of programs leading to the bachelor's degree in General Science, each having differing requirements, as follows:

Non-Teaching and Non-Health Related

A student must earn 44 semester hours (48 for the B.S. degree) of credit for courses from any three of the science-mathematics areas in the College of Liberal Arts (biochemistry, botany, chemistry, mathematical sciences, geology, microbiology, physics-astronomy, and zoology), with at least 20 semester hours in one of these areas.

All students who graduate with a degree in general science (non-teaching) and are not in a joint degree or professional program listed below must complete one of the following mathematics courses, its equivalent, or a higher level mathematics course at the college level:

22S:8 Quantitative Methods II	4 s.h.
22M:11 Fundamentals of College Mathematics II	4 s.h.
22M:16 Calculus for the Biological Sciences	3 s.h.
22M:20 Elementary Functions	3 s.h.
Any 22C course except 22C:1	

Health Related–Joint Programs

A student must earn 44 semester hours (48 for the B.S. degree) of credit for courses from any three of the science-mathematics areas in the College of Liberal Arts (biochemistry, botany, chemistry, mathematical sciences, geology, microbiology, physics-astronomy, and zoology), with at least 20 semester hours in one of these areas.

Students admitted into the College of Dentistry or College of Medicine prior to obtaining a bachelor's degree, and students admitted into the professional programs in Medical Technology, Nuclear Medical Technology, or Physical Therapy, may substitute from their first year of professional training 30 semester hours of credit toward the 124 needed for graduation, including:

Eight semester hours of science toward the 44 or 48 needed toward the general science major; and
Four semester hours of science toward the 20 needed in one area in the major.

Students should consult other appropriate sections of this catalog for further information concerning other features of these professional and preprofessional programs. The description here pertains only to the Liberal Arts requirements for a bachelor's degree in general science, and should not imply anything further concerning specific program requirements in a particular health field.

Teaching

A student may earn a B.A. or B.S. degree in general science by completing one of the approved sequences for 56 semester hours. Students desiring certification to teach science in secondary schools must also complete the certification requirements, which include a 26 semester hour sequence of courses in education.

All of the general science sequences must include two of the following:

97:102 Societal and Educational Applications of Earth Science Concepts and Topics	arr.
or	
97:103 Societal and Educational Applications of Biological Concepts	3 s.h.
or	
97:105 Societal and Educational Applications of Selected Concepts of Physics	arr.
or	
97:106 Societal and Educational Applications of Chemical Concepts	arr.
or	
97:140 Problems in Integrating the Teaching of Environmental Science	3 s.h.

All sequences must include all of the following:

97:128 Meaning of Science	2 s.h.
97:130 Science in Historical Perspective	2 s.h.
4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Elementary Chemistry Laboratory I	2 s.h.

Requirements for the approved sequences in general science include the following, in addition to those listed above as common to all approved sequences:

Biology Emphasis

Adviser: John E. Penick

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
Electives in botany, microbiology, or zoology, including work in genetics, ecology, and physiology	14 s.h.
4:121 Organic Chemistry I	3 s.h.
Chemistry electives	5 s.h.
12:3 Principles of Physical Geology	2 s.h.
or	
12:4 Principles of Historical Geology	2 s.h.
29:11 College Physics	4 s.h.
97:103 Societal and Educational Applications of Biological Concepts	3 s.h.

At least 25 of the 56 semester hours in this sequence must be earned in 100-level courses.

Upon successful completion of the program, including the education sequence, the student is recommended for certification to teach general science, biology, chemistry, and physical science.

Chemistry Emphasis

Adviser: Vincent N. Lunetta

4:121 Organic Chemistry I	3 s.h.
4:131 Physical Chemistry I	3 s.h.
4:141 Intermediate Chemistry Laboratory I	2 s.h.
97:106 Societal and Educational Applications of Chemical Concepts	arr.
29:11-12 College Physics	8 s.h.
and	
7 s.h. of physics electives	
or	
29:17-19 Introductory Physics I-III	12 s.h.
and	
3 s.h. of physics electives	
22M:35-36 Engineering Calculus I-II	8 s.h.

At least 20 of the 56 semester hours in this sequence must be earned in 100-level courses.

Students successfully completing this program, including the education sequence, are recommended for certification to teach physical science, chemistry, and physics. A student who, in addition, earns six semester hours of credit in biology is also recommended for certification to teach general science.

Earth Science Emphasis

Adviser: Edward L. Pizzini

12:3 Principles of Physical Geology	2 s.h.
or	
12:103 Physical Geology	2 s.h.
12:4 Principles of Historical Geology	2 s.h.
or	
12:104 Historical Geology	2 s.h.
12:41 Mineralogy	4 s.h.
97:102 Societal and Educational Applications of Earth Science Concepts and Topics	arr.
Earth science electives	8 s.h.
29:11-12 College Physics	8 s.h.
29:61- 62 General Astronomy	8 s.h.
44:101 Introduction to Weather and Climate	3 s.h.

At least 20 of the 56 semester hours in this sequence must be earned in 100-level courses.

Students successfully completing this sequence are recommended for certification to teach physical and earth science. Those who earn, in addition, six semester hours of credit in biology are also recommended for certification to teach general science.

Environmental Studies Emphasis

Adviser: Daniel Sheldon

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
37:109 Genetics	3 s.h.
37:132 Ecology	4 s.h.
Electives in biology	7 s.h.
97:140 Problems in Integrating the Teaching of Environmental Science	3 s.h.
At least 16 s.h. of geology, geography, environmental engineering, and/or environmental health courses	

At least 20 of the 56 semester hours in this sequence must be earned in 100-level courses.

Students successfully completing the program, including the education sequence, are recommended for certification to teach general science and biology.

Physics Emphasis

Adviser: Vincent N. Lunetta

29:11-12 College Physics	8 s.h.
and	
29:17 Introductory Physics I	4 s.h.
or	
29:18 Introductory Physics II	4 s.h.
and	
29:19 Introductory Physics III	4 s.h.
Physics electives	14 s.h.
22M:35-36 Engineering Calculus I-II	8 s.h.
4:121 Organic Chemistry I	3 s.h.
4:131 Physical Chemistry I	3 s.h.

At least 10 of the 56 semester hours in this sequence must be earned in 100-level courses.

Students completing the program, including the education sequence, are recommended for certification to teach physical science, chemistry, and physics. Those who, in addition, earn six semester hours of credit in biology are also recommended for certification to teach general science. Those who, in addition, earn 12 semester hours of credit in astronomy and geology are also recommended for certification to teach earth science.

Minors in Science Teaching

Six science teaching minors are available for persons with teaching majors in other academic areas. All require 31 semester hours of credit, excepting the two general science minors, which require 35.

Students who wish to pursue a science teaching minor and to qualify for University of Iowa recommendation for teaching certification should consult a faculty member in Science Education.

All science teaching minors must include:

7S:151 Science Methods I: Individualizing Instruction in Science	2 s.h.
7S:152 Science Methods II: Resources and Teaching Strategies	2 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	3 s.h.
97:128 Meaning of Science	2 s.h.
97:130 Science in Historical Perspective	2 s.h.

Other basic requirements:

Biology

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
97:103 Societal and Educational Applications of Biological Concepts	arr.
Botany and zoology electives	9 s.h.

Chemistry

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Elementary Chemistry Laboratory I	2 s.h.
97:106 Societal and Educational Applications of Chemical Concepts	arr.
Chemistry electives	10 s.h.

Physics

29:11-12 College Physics	8 s.h.
97:105 Societal and Educational Applications of Selected Concepts of Physics	arr.
Physics electives	10 s.h.

General Science I

2:1 Introduction to Botany	4 s.h.
29:61 General Astronomy	4 s.h.
12:3 Principles of Physical Geology	2 s.h.
or	
12:4 Principles of Historical Geology	2 s.h.
4:13 Principles of Chemistry I	3 s.h.
29:11 College Physics	4 s.h.

General Science II (Environmental Studies Emphasis)

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
37:132 Ecology	2, 4 s.h.
4:13 Principles of Chemistry I	3 s.h.
Electives in environmental engineering	3 s.h.
97:140 Problems in Integrating the Teaching of Environmental Science	3 s.h.

Earth Science

12:3 Principles of Physical Geology	2 s.h.
12:4 Principles of Historical Geology	2 s.h.
29:61 General Astronomy	4 s.h.
Geology and astronomy electives	10 s.h.
97:102 Societal and Educational Applications of Earth Science Concepts and Topics	arr.

Special Rules

Since the General Science Program involves large numbers of students heading for a variety of professional and graduate areas, large numbers of faculty advisers, and several colleges and departments, some special rules and regulations have been approved by the General Science Advisory Committee of the College of Liberal Arts (consisting of the department executive officers of biochemistry, botany, chemistry, geology, physics-astronomy, microbiology, zoology, and general science). These special rules include:

At least ten semester hours of graded credit in science must be earned at The University of Iowa.

Transfer students using any of the joint programs must complete their last 30 semester hours in residence in the College of Liberal Arts at The University of Iowa in order to be eligible for the B.A. or B.S. degree one year later.

General Science majors should meet their language requirement with German, French, or Russian. An academic adviser may approve the use of another language if there are circumstances making such a choice desirable. Letters approving other languages are filed with the student's records in the Registrar's Office.

No "11" numbered science core courses or credit from the CLEP Natural Science General Examination may be used toward the major in General Science (44 or 48 semester hours).

Science courses taken in other colleges within the University (for example, Colleges of Engineering and Medicine) will not be accepted toward the 44 or 48 semester hours needed for the major unless one of the science departments of the College of Liberal Arts listed above certifies in writing to the Registrar's Office that such a course is equivalent to one offered or required of majors in that department.

No courses taken in the three departments used for the major (non-teaching, health-related, or teaching) may be taken Pass/Fail. Grades from all courses in the three departments used for the General Science major will be used in computing a student's grade-point average in the major both at The University of Iowa and overall.

Since mathematics forms an integral part of so many aspects of modern science, all General Science students are urged to complete numerous appropriate advanced courses in both pure and applied mathematics (including statistics and computer science) in order that they may be qualified at a later date to do graduate work and quantitative research.

Genetics

Program chair: J. Dawson Mohler
Faculty: *professors* Roger Chalkley (Biochemistry), Thomas Conway (Biochemistry), Irving Crawford (Microbiology), Joseph Frankel (Zoology), Joseph Hegmann (Zoology), Victor Ionasescu (Pediatrics), John Menninger (Zoology), Roger Milkman (Zoology), Dawson Mohler (Zoology), Erich Sbx (Microbiology), George Winokur (Psychiatry), Hans Zellweger (Pediatrics)
associate professors Wayne Carlson (Botany), Raymond Crowe (Psychiatry), John Donelson (Biochemistry), Michael Feiss (Microbiology), Gary Gussin (Zoology), David R. Soll (Zoology), Ming Tsuang (Psychiatry), Donald Walker (Microbiology)
assistant professors Kathleen Bucher (Preventive Medicine), Dwight Cruikshank (Obstetrics/Gynecology), James Hanson (Pediatrics), George Judisch (Ophthalmology), Carol Newlon (Zoology), Helmut Schrott (Internal Medicine), Shivanand Patil (Pediatrics), Wei-yeh Wang (Botany), Chun-Fang Wu (Zoology)
Degree offered: Ph.D.

The Interdepartmental Ph.D. Program in Genetics

The Interdepartmental Ph.D. Program in Genetics is designed to promote collaborative investigations and strong intellectual interactions among individual students and faculty participants who may be formally affiliated with different departments.

Students enrolling in the program are encouraged to obtain a broad background in genetics, ranging from molecular to population genetics. Within this context, course requirements are nevertheless flexible enough to permit students to tailor their formal coursework to fit their individual needs. All students enrolled in the Interdepartmental Genetics Ph.D. Program are required to take three specific courses—General Biochemistry, Advanced Genetics and a one-hour seminar course given each semester. In addition, upper-level courses are grouped roughly into three areas—molecular and microbial genetics, cell and developmental genetics, and quantitative and population genetics; students are required to elect three semester hours of courses in each of the three areas. Additional courses in genetics or related disciplines can be elected to provide supplementary background in the student's particular area of specialization.

Even more important than formal coursework is the opportunity to do meaningful research. Faculty members participating in the Ph.D. Program in Genetics all conduct active, stimulating research programs. Students are encouraged to enter the laboratory of their choice and begin their own research as quickly as possible. Research interests of the participating faculty range broadly from bacteriophage to human medical genetics. In each area of genetics there is a group of faculty members with closely related or overlapping interests. In addition, the University is strong in several related disciplines, including microbial physiology; enzymology; virology; protein biochemistry; developmental, cell and population biology, all of which contribute significantly to the overall training program.

In addition to research and coursework, students must also pass a comprehensive examination, which should usually be taken within the first two years in the program.

Entrance Requirements

It is expected that prospective students will have a strong undergraduate background in science and a strong commitment to research and teaching in genetics. Students should have taken courses in general genetics, organic chemistry, introductory physics and mathematics. Deficiencies in a particular area can be made up during the first year of graduate study. Criteria for admission include undergraduate academic record, performance on the Graduate Record Examination (GRE) verbal, quantitative, and analytic aptitude tests, and letters of recommendation. Requirements for admission are not rigid. Although almost all students currently in genetics at Iowa have undergraduate grade-point averages greater than 3.2 and GRE totals (verbal plus quantitative) exceeding 1250, students with lower GPAs or GRE scores may be admitted depending on other indicators of their academic potential.

Applications for admission will be accepted any time but should be received by February 15 to insure consideration for entrance the following academic year.

Financial Aid

The most highly qualified applicants will be supported as National Institutes of Health predoctoral trainees. Traineeships include a stipend of $3,900 for 12 months, complete tuition scholarships and additional support for trainees' research. In addition, stipends will be supplemented by occasional teaching or research. (Trainees are encouraged to do some teaching as part of their development as scientists and teachers.)

Students may also be supported by half-time teaching or research assistantships, with stipends of about $5,000 per year. Students receiving assistantships may also apply for full or partial tuition scholarships.

Medical Scientist Training Program

Students may combine study toward an M.D. and a Ph.D. in genetics. Further information about this program can be obtained from the director of the Medical Scientist Training Program in the College of Medicine.

Departmental Ph.D. Programs

The Departments of Biochemistry, Botany, Microbiology and Zoology offer degree programs in which students may specialize in a particular aspect of genetics. Students are referred to departmental descriptions elsewhere in this *Catalog* for further information about these programs.

The following genetics courses are available to graduate students in the Genetics Program:

99:178 Advanced Genetics (same as 2:178, 61:178, 37:178)	4 s.h.
2:104 Cytogenetics	3 s.h.
2:160 Genetics and Biogenesis of Cell Organelles	3 s.h.
2:215 Genetics Seminar (same as 99:215, 61:215, 37:215)	0-2 s.h.
50:175 Human Genetics	2 s.h.
61:170 Microbial Genetics	3 s.h.
61:175 Microbial Genetics Laboratory	1 s.h.
61:270 Topics in Molecular Biology	arr.
37:162 Population and Evolutionary Genetics	3 s.h.
37:163 Behavioral Genetics	3 s.h.
37:165 Quantitative Genetics	3 s.h.
37:171 Molecular Genetics	4 s.h.
37:172 Topics in Molecular Genetics	2 s.h.
37:173 Molecular Genetics Laboratory	1-2 s.h.
37:175 Topics in Evolutionary Genetics	1-2 s.h.
37:176 Topics in Eukaryotic Molecular Biology	2 s.h.
37:260 Developmental Genetics	2 s.h.
37:263 Seminar: Behavioral Genetics	1 s.h.

Geography

Department chair: James B. Lindberg
Faculty: *professors* Kenneth J. Dueker, Clyde F. Kohn, James B. Lindberg, Michael L. McNulty, David R. Reynolds, Gerard Rushton, Neil E. Salisbury
associate professors William Graf, Rex D. Honey
assistant professors Konstantinos Koutsopoulos, Russell Lee
Degrees offered: B.A., B.S., M.A., Ph.D.

Modern geography is concerned mainly with the spatial aspects of human and physical geography and with man/environment relations. Students who elect courses in geography soon find that the insights and methods of inquiry they develop are applicable to the solution of many of the complex problems confronting modern societies, such as air and water pollution, transportation problems, the development of ghettos in large cities, distribution and consumption of natural resources, rapidly increasing populations and conflicts between nations. Studies in geography provide students with concepts and methods for organizing such spatial units as urban areas, market regions, school districts and other kinds of service areas. Thus, today's geography contributes to the decision-making processes involved in determining how individuals or groups of individuals can improve the quality of life in this complex age.

Much of modern geography is problem-oriented. It is scientific as well as humanistic in its approach to the solution of these problems. It is involved with two types of analytical considerations: the best means to obtain accurate facts or data; and the tools and techniques necessary for analyzing these data to see if they verify or alter existing explanations for the facts as they are observed.

Career opportunities for majors in geography exist in various branches of government and in business. There is a demand for persons capable of dealing with resource management, economic development, market area analysis and other problems related to the distribution and spatial interaction of physical, economic, social and political phenomena in the world as a whole or in major parts of it.

There is also a growing demand for young people concerned with human perception of, and subsequent interactions with, the total environment. Courses in geography are commonly required of students preparing to enter the teaching profession at the elementary and secondary school levels, of students who want to work in urban and regional planning, and as a background for many related professions, including law, health care delivery systems and transportation engineering.

The Undergraduate Program

The Geography faculty has developed an undergraduate instructional program which provides educational opportunities for a variety of students: (1) for the nonmajor interested in one or more elective courses as they relate to a liberal education, or for those interested in electing a cluster of courses in conjunction with another discipline or for the B.G.S. degree; and (2) for those interested in acquiring a major in geography. The Department also joins in significant interdepartmental programs involving regional, urban, and environmental components.

Courses for the Nonmajor

Students in the College of Liberal Arts or other schools and colleges of the University who do not plan to major in geography may find meaningful such courses as 44:116 Urban Political Geography, 44:126 American Wilderness: Environments and Issues, 44:136 The Inner City, 44:139 Urban Problems, 44:162 The Third World, 44:165 The Changing World and 44:191 Energy in Contemporary Society.

Students in several related disciplines and in the Bachelor of General Studies program take clusters of courses in geography according to their individual interests.

Those specializing in environmental studies might elect such upper-level courses as 44:101 Introduction to Weather and Climate, 44:119 Natural Environmental Issues, 44:120 Natural Hazards, 44:121 Stream Processes and Water Resources, 44:122 Natural Resources of the United States, 44:123 Geography of Natural Resources, 44:125 Environmental Impact Studies and 44:180 Field Techniques in Natural Environmental Problems.

For students interested in a cluster of advanced courses in urban studies, the Department offers 44:111 Introduction to Urban Transportation, 44:116 Urban Political Geography, 44:135 Urban Geography, 44:136 The Inner City, 44:137 Metropolitan Growth and Development and 44:139 Urban Problems.

Students in business may benefit from taking such locational analysis courses as 44:30 Introduction to Economic Geography, 44:130 Location of Services and 44:132 Industrial Location.

Alternative Programs for the Undergraduate Major

Students electing to major in geography will be exposed to concepts and methods of inquiry in physical, economic, social and political geography. They will be taught how to state problems from a geographic point of view, where and how to find relevant data for analyzing these problems, how to relate their findings to existing theories and how to apply their findings to real world situations.

Students majoring in geography may choose alternative programs depending on their interests. The substantive strengths of the Department fall into four areas: environmental studies, urban and regional studies, locational analysis, and international development studies. Students may choose to develop expertise in one of these areas, or they may choose to develop an individualized program within the curriculum offered by the Department. Students planning advanced training or seeking careers in geography should elect the Bachelor of Science degree. Those who wish to pursue a liberal arts objective are advised to elect the Bachelor of Arts degree.

All geography majors must complete a minimum of 26 semester hours of geography coursework, at least 15 of which must be at the 100-level. Many students will find that they will need more than the minimum requirements for mastery of a specific subfield.

All majors must complete the course 22S:127 Applied Statistical Methods and Computations, or its equivalent as approved by the departmental chair on recommendation of the student's adviser, and 44:150 Undergraduate Seminar for Geography Majors. Other than these two courses, the requirements vary with the specific program selected by the student.

Bachelor of Science students must complete either 22C:7 Introduction to Computing with FORTRAN or 22C:16 Introduction to Programming with PL/1 with consent of adviser, or 22M:25 Calculus I.

Environmental Studies

The undergraduate program in environmental studies is designed for students with career expectations or personal interests in resource management or environmental protection, or who have interests in physical geography per se. The program provides a knowledge of physical processes in landform development, atmospheric conditions, soil development and biotic communities. It stresses the interrelationships among those processes and gives the student knowledge necessary to assess the impact of human activities on physical systems. Training in field observation, quantitative analysis, computer methods and cartographic representation are included in this concentration.

Required courses include 22S:127 Applied Statistical Methods and Computations, 44:150 Undergraduate Seminar for Geography Majors, 44:180 Field Techniques in Natural Environmental Problems and 22C:7 Introduction to Computing with FORTRAN or 22C:16 Introduction to Programming with PL/1 with consent of adviser, or 22M:25 Calculus I.

Students concentrating in environmental studies are advised to select substantive courses from among the following:

44:1 Introduction to Human Geography
44:2 Natural Environment and Man
44:101 Introduction to Weather and Climate
44:119 Natural Environmental Issues
44:120 Natural Hazards
44:121 Stream Processes and Water Resources
44:122 Natural Resources of the United States
44:123 Geography of Natural Resources
44:125 Environmental Impact Studies

Also recommended are 44:107 Maps and Mapping and 44:109 Computer Methods in Geographical Analysis.

Under the direction of an adviser, students should select courses in related disciplines from among the following:

12:5 Introduction to Geology
12:6 Evolution of the Earth
12:110 Geologic Remote Sensing
12:108 Introduction to Oceanography
12:110 Geologic Remote Sensing
12:112 Geologic Field Methods
12:171 Geomorphology

34:170 Population and Society
or
34:175 Introduction to Demography

6E:133 Economic Growth and Environmental Decay
37:125 A Planet in Crisis
527:102 Technology of Environmental Pollution Control

Urban and Regional Studies

Students with interests in urban and regional analysis will find this concentration relevant, either as background training for graduate work or as preparation for entry-level positions in government and private businesses. This concentration focuses on the problems and potentials of towns, cities and regions, and the decision-making processes of individuals and institutions. Dealing with such problems as assessing sites for development potential, locating public facilities and gauging neighborhood change brings the student inside the dynamic of contemporary cities. Requisite skills in quantitative analysis, cartography and computer usage are developed. Opportunities for experience in working with real problems are included.

Required courses are:

22S:131 Statistical Methods with Applications
44:138 Spatial Organization
44:150 Undergraduate Seminar for Geography Majors

22C:7 Introduction to Computing with FORTRAN
or
22C:16 Introduction to Programming with PL/1 (with consent of adviser)
or
22M:25 Calculus I

Students concentrating in urban and regional analysis are advised to select substantive courses from the following:

44:1 Introduction to Human Geography
44:2 Natural Environment and Man
44:11 Introduction to Social Geography
44:30 Introduction to Economic Geography
44:33 Transportation in the USA: Issues and Problems
44:35 Introduction to Urban Geography
44:111 Introduction to Urban Transportation
44:116 Urban Political Geography
44:130 Location of Services
44:132 Industrial Location
44:135 Urban Geography
44:136 The Inner City
44:137 Metropolitan Growth and Development
44:139 Urban Problems

Also recommended:

44:107 Maps and Mapping
44:109 Computer Methods in Geographical Analysis

Under the direction of an adviser, students should select courses in related disciplines from among the following:

113:119 Urban Anthropology
16:187 The City in American History
30:111 Municipal Government and Politics
34:172 Social Dynamics of Urban Life
102:102 Case Studies: Urban and Regional Planning
102:108 Housing Analysis
6E:135 Regional and Urban Economics
6E:137 Problems in Urban Economics

Locational Analysis

The concentration in locational analysis is designed for students who wish to gain expertise in this more traditional problem-solving field within human geography. Students learn to use modern technology to help them calculate solutions to such locational problems as selecting the best site for a store or public facility, estimating demand in an area, developing models of consumer behavior and gauging the impact of locational decisions.

The required professional courses include:

22S:127 Applied Statistical Methods and Computations
44:138 Spatial Organization
44:150 Undergraduate Seminar for Geography Majors
44:109 Computer Methods in Geographical Analysis

22C:7 Introduction to Computing with FORTRAN

or
22M:25 Calculus I

Students concentrating in locational analysis are advised to select substantive courses from the following:

44:1 Introduction to Human Geography
44:30 Introduction to Economic Geography
44:33 Transportation in the USA: Issues and Problems
44:111 Introduction to Urban Transportation
44:130 Location of Services
44:132 Industrial Location
44:137 Metropolitan Growth and Development
44:139 Urban Problems

One additional technique course is also recommended:

44:107 Maps and Mapping

Under the direction of an adviser, students should select courses in related disciplines from among the following:

6E:103 Microeconomics
6E:113 Health Economics
6E:141 Industrial Organization
586:141 Introduction to Operations Research
6B:134 Marketing Research
102:108 Housing Analysis

International Development Studies

The concentration in international studies is designed for students interested in international affairs; in the economic, social, and political development of new and old nations; in the solution of regional problems that have global implications; and in cross-cultural comparisons of different values. This concentration aims to give students a deeper understanding of the world in which they will live and work by emphasizing the variety of cultures and societies which exist outside of the United States and to which our country must relate.

Required courses include:

22S:127 Applied Statistical Methods and Computations
44:138 Spatial Organization
44:150 Undergraduate Seminar for Geography Majors

Students interested in this area of study are advised to select courses from among the following:

44:1 Introduction to Human Geography
44:2 Natural Environment and Man
44:19 Natural Environmental Issues
44:30 Introduction to Economic Geography
44:35 Introduction to Urban Geography
44:124 Introduction to the Global Environment
44:127 World Food Problems
44:132 Industrial Location
44:161 African Development
44:162 The Third World
44:165 The Changing World
44:191 Energy in Contemporary Society

Under the direction of an adviser, students should select courses in related disciplines from among the following:

30:60 Introduction to World Politics
30:150 Politics of Modernization
30:160 International Politics
30:166 Politics of War and Peace
30:127 Policy Problems in Industrial Societies
6E:123 Political Economy of the Military-Industrial Complex
6E:129 Economic Development of Underdeveloped Areas
16:147 Marxism and Social Thought
16:170 Modern African History
16:196 Modern China

Appropriate foreign language training might also be a part of the student's training.

Individual Programs

If none of these four alternatives is appropriate, students may design their own individual programs of instruction with the help of their advisers. Such programs, however, must include 22S:127, 44:138, and 44:150.

The Cooperative Education Program

The Department of Geography is a participant in the University's Cooperative Education Program, which provides opportunities for both undergraduate and graduate students to secure cooperative training assignments related to their academic programs.

The Graduate Program

The goals of the Department at the graduate level are to prepare students to carry on creative and productive research in geography involving the use of theory, modeling and formal verification methods; to prepare students for positions in research, teaching, or some area of applied geography; and to help students develop their ability to apply knowledge of facts, theories and methodology to specific societal programs. The achievement of these goals is demonstrated in large measure by the demand for Iowa graduates to fill positions on college and university faculties, in research-oriented institutions and in business and government.

The graduate program at Iowa is concerned with the locational analysis of physical, economic, social and political phenomena; the spatial aspects of human behavior; and the interaction of humans and their environment.

The Department offers specialized instruction in the teaching of geography at the college level (44:206 Teaching College Geography and 44:306 Research Seminar: The Teaching of Geography) for those interested in academic careers. Opportunities are provided for all graduate students to gain practical teaching experience through service as departmental teaching assistants or through other supervised teaching duties. Graduate students who plan to become college teachers are strongly encouraged to complete 44:206 Teaching College Geography.

Master of Arts Programs

The Department offers two programs leading to the Master of Arts degree, with and without thesis. Within this framework, there are two major tracks: one for students who wish to prepare for positions in research or teaching; the other for students who are interested in some area of applied geography.

Students whose objective is the Master of Arts degree leading to a career in teaching or research are required to complete a minimum of 30 semester hours of graduate work, of which 15 semester hours must be 200-level courses or above, including a minimum of two units of 44:201-202 Geographical Analysis I-II, and 44:208 Quantitative Analysis I. The remainder of

their programs must be composed of graduate-level courses or research seminars as approved by the faculty or the student's adviser. A maximum of six semester hours of credit may be earned by the satisfactory completion of a thesis for those who wish to take the Master of Arts degree with thesis. All students must pass a final examination.

Students whose objective is the Master of Arts degree leading to a career in some area of applied geography (commonly referred to as the Master of Arts program in applied geography) are required to complete a minimum of 30 semester hours of graduate work, of which 15 semester hours must be 200-level courses or above, including a minimum of two units of 44:201-202 Geographical Analysis I-II, 44:208 Quantitative Analysis I, and 44:300 Seminar in Applied Problems. A computer language course, a cartography course or its equivalent and 44:208 Quantitative Analysis I, are required as prerequisites for 44:300. The remainder of the program will be composed of courses in geography and related departments as approved by the student's faculty adviser. Students are advised that it is possible to complete the Master of Arts program in applied geography in one year if they enter with sufficient background. Those whose background is not adequate should plan additional time. All students must pass a final oral and/or written examination. The coordinator of the program will conduct an initial screening and advising of incoming students. An appropriate adviser in the student's specified area of interest will be assigned to assist in tailoring a program to suit the needs of the student. Suggested sample programs have been formulated and may be used as guidelines. Students should inquire about the internship program.

Doctor of Philosophy

Students whose objective is the Doctor of Philosophy degree are required to complete eight hours of 44:201-202 Geographical Analysis I-II and 44:208-209 Quantitative Analysis I-II. The eight mini-courses comprising 44:201-202 should be taken within the first two years in residence and must include mini-courses offered by at least six different faculty. The courses 44:208-209 should be taken during the first year in residence. Students may meet these requirements with a satisfactory performance in written examinations during the first week of the first semester for which they register.

All doctoral students must also complete two research seminars, preferably during their second year in residence, under the direction of different faculty members. Unless excused by the faculty, they are also required to register for 44:350 Research Seminar: Staff each semester while in residence. One semester hour of credit will be awarded each semester on a satisfactory/unsatisfactory basis for this course.

The remainder of the Ph.D. program includes appropriate graduate courses, seminars and research in geography chosen by students to reflect their area of interest; courses in disciplines closely related to the student's objectives and interests; and courses which satisfy the tool requirements.

No later than their fourth semester in residence, doctoral students should declare a field of specialization within their general areas of interest and secure a faculty adviser to direct their program of study.

Preferably during their second year in residence, and not later than the fifth semester, doctoral students who have been admitted to the graduate program without advanced credit must submit an original research paper to the faculty, with the approval of their adviser. Students who have been admitted with advanced graduate credit of 24 semester hours or more, or the equivalent, must meet this requirement no later than their third semester in residence. The faculty will pass upon the merits of the research thus demonstrated. Students become Ph.D. candidates when their qualifying paper has been accepted.

Research tool requirements for Ph.D. candidates are the course 44:209 Quantitative Analysis II and another appropriate course, as approved by the faculty at the time the student declares his or her specific area of specialization.

Upon passing the comprehensive examination, the doctoral candidate will prepare a research design to be presented before the staff seminar. After receiving the critical comments of faculty and students, the candidate is expected to conduct the necessary research and to present his or her findings in a dissertation which must be defended in a final oral examination.

All doctoral candidates are expected to have supervised experiences as classroom instructors and research assistants before being awarded the Ph.D. degree.

Graduate Admission

In addition to the general rules and regulations set forth in the *Manual of Rules and Regulations of the Graduate College*, the Department considers the applicant's undergraduate grade-point average, especially during his or her junior and senior years; scores on the Graduate Record Examination Aptitude Test; letters of recommendation from those with whom he or she has taken courses; and an essay in which the applicant sets forth the reasons for wanting to study geography at The University of Iowa.

An applicant with an undergraduate grade-point average between 2.3 and 2.75 will be admitted only for the M.A. degree and on the condition that he or she achieves a grade-point average of 2.75 or better on the first 12 hours of graduate work as approved by the Department.

Foreign students and others from undergraduate institutions which evaluate students on a basis other than grade-point averages will be considered according to their relative academic standing in their respective institutions.

Financial Assistance

A number of graduate appointments as teaching or research assistants are available. Awards are based on merit and, to be appointed to a teaching or research assistantship, a student must ordinarily have achieved a combined score of 1100 on the GRE Verbal and Quantitative examinations and have a 3.0 undergraduate or graduate grade-point average. Applications for graduate appointments are usually considered at the end of the second week in February.

Special Facilities

The Department possesses substantial equipment in the computer-mapping area, including a Graf pen digitizer supported by the IMLAC-PDS-4 mini-computer with a CRT for on-line editing of digitizing work and a hard copier. The University has an IBM 360 Model 65 computer, a Cyber 71 computer, and a CALCOMP plotter available to the Department. In addition, an HP 2000F system with beehive terminals is available for instructional use. The Map Library contains more than 75,000 maps, a total of 2050 atlases and reference works, and

about 80,000 aerial photographs, primarily of Iowa. The library is a depository for maps of the U.S. Army Topographic Command, formerly Army Map Service. The Geology Library contains approximately 50,000 maps, including both geologic maps and U.S. Geological Survey topographic maps. The Department of Geography has its own collection of topographic maps, maps of large urban centers and aerial photographs for use by students in laboratory exercises.

Courses

Courses open to undergraduate students may be taken in any order or simultaneously. It is recommended, however, that majors take 44:136 and 44:150 in that sequence. All courses below the 100-level are open to freshmen; 44:1, 44:2, 44:11, 44:19, and 44:30 are available for social science core credit.

Primarily for Undergraduates

44:000 Cooperative Education Training Assignment 0 s.h.

44:1 Introduction to Human Geography 4 s.h.
Application of geographic principles to contemporary social, economic and political problems; urban growth; problems of the ghetto; diffusion of innovations; territoriality and perception.

44:2 Natural Environment and Man 4 s.h.
Spatial distribution of the world's natural resources including climate, water, landforms, soils, vegetation and minerals; human role in defining nature of resource base; regional problems in resource use, environmental pollution and natural hazards.

44:11 Introduction to Social Geography 4 s.h.
Spatial considerations of population growth and distribution; minorities within a population; poverty; housing; social organization and disorganization; social systems including education, religion, recreation, medical, and social services; diffusion of ideas and traits over space.

44:19 Natural Environmental Issues 2-3 s.h.
Issues arising from human use of natural environment and related problems resulting from expanding world population; air, water and land pollution; population pressures on agricultural resources; energy and mineral resource requirements versus quality of environment.

44:30 Introduction to Economic Geography 3 s.h.
Location and spatial organization of world's major types of economies: agriculture, energy and minerals, manufacturing, transportation; trade and service centers.

44:33 Transportation in the USA: Issues and Problems 3 s.h.
Basic concepts of transportation and their relationship to geography; spatial processes and spatial structures associated with transportation.

44:35 Introduction to Urban Geography 3 s.h.
Processes of urbanization and city growth; spatial structure and pattern of urban activities; geographic considerations of contemporary urban problems; the city and its physical setting; comparative urban studies.

44:100 Readings for Undergraduates arr.
Supervised readings in geography. Prerequisite: consent of instructor.

Courses for Undergraduates and Graduates

44:101 Introduction to Weather and Climate 3 s.h.
Spatial distribution of weather elements, wind circulation, air masses, storms and general world climatic conditions including air pollution and climatic change; laboratory work in study of weather maps and climatic data.

44:107 Maps and Mapping 2 s.h.
Qualities of a good map or diagram; types of maps or diagrams for particular uses; major types of cartographic presentations; available tools for constructing maps and diagrams; procedures for the compilation of maps and diagrams; laboratory experiences in compiling maps and diagrams.

44:108 Introduction to Quantitative Methods in Geography 3 s.h.
Applications of mathematical and statistical techniques in geography.

44:109 Computer Methods in Geographical Analysis 2 s.h.
Use of computer mapping as a tool in geographic analysis; various mapping programs including SYMAP, CALFORM and others. Prerequisite: 22C:7 or equivalent.

44:111 Introduction to Urban Transportation 3 s.h.
Urban transportation defining the land use/transport system and the urban transportation planning process; transportation problems, especially as evidenced in Iowa City.

44:115 Urban Political Geography 3 s.h.
Relationships between individual political behavior and the functional and geographical organization of urban political systems; U.S. metropolitan areas and the satisfaction of citizen preferences for public goods and services.

44:119 Natural Environmental Issues 2-3 s.h.
Issues arising from human use of the natural environment and related problems resulting from an expanding world population; air, water and land pollution; population pressures in agricultural resources; energy and mineral resource requirements versus the quality of the environment.

44:120 Natural Hazards 3 s.h.
Human-environment relationships under extreme environmental conditions; causes, characteristics and consequences of extreme events such as earthquakes, tornadoes, blizzards, droughts and floods; human adjustments to these events.

44:121 Stream Processes and Water Resources 3 s.h.
Water as a resource and as an agent in shaping the form of the land surface, characteristics of stream drainage basins and alluvial landforms, floods and their interrelationships with land use. Prerequisite: 44:2 or consent of instructor.

44:122 Natural Resources of the United States 3 s.h.
Nature and patterns of regional differences in the natural resource base for agriculture and industry including land, water and minerals; environmental problems and conflicts arising from resource development.

44:123 Geography of Natural Resources 3 s.h.
Definition, evaluation and exploitation of natural resources as developed through time and within different cultural settings.

44:124 Introduction to the Global Environment 3 s.h.
Interdependence of the three major world ecosystems: land, atmosphere and oceans. Problems resulting from the impact upon the natural environment of human activities in support of world society.

44:125 Environmental Impact Studies 3 s.h.
Writing, attacking and defending environmental impact assessments; sources of environmental information; photo interpretation for impact assessment. Prerequisites: Geography major, or 12 semester hours in geography, consent of instructor.

44:126 American Wilderness: Environments and Issues 2-3 s.h.
Environmental issues concerning land management strategies and trade-offs between wilderness and preservation and resource exploitation. Historical geography of American wilderness areas and discussion of their natural environments.

44:127 World Food Problems 2 s.h.
Nature of current world food problems and the global distribution of environmental resources which govern food production capabilites; includes processing and storage practices, global variations in agricultural systems and technologies, potential and limitations for increasing quantity and quality of food production in context of environmental, political, and socioeconomic constraints.

44:130 Location of Services 3 s.h.
Problems in the effective spatial organization of public and private facilities; central place theory; modeling spatial choices between service sites; spatial outcomes of alternative behavioral strategies for reorganizing service systems; location-allocation algorithms and their use in planning and evaluating the spatial delivery of social and economic services.

44:132 Industrial Location 3 s.h.
Theory and practice of manufacturing location and its application to different industries and types of economy; investigations of selected case studies.

44:135 Urban Geography 3 s.h.
Models of urban growth and urban forms; spatial patterns of selected activities; processes that generate these patterns; current problems.

44:136 The Inner City 3 s.h.
Residential segregation of minorities, spatial structure of ghetto areas; environmental quality of inner city neighborhoods; spatial aspects of problems of economic and social stress. Same as 45:136.

44:137 Metropolitan Growth and Development 3 s.h.
Historical and contemporary forces affecting the development of metropolitan areas; contextual and spatial perspective on forces of change; population processes and spatial population forecasting; value orientation, change and conflict; policy issues.

44:138 Spatial Organization 3 s.h.
Approaches to spatial analysis of human activities and natural processes. Fall.

44:139 Urban Problems 3 s.h.
Geographical perspective on problems of urban life; processes involved and policy implications of such topics as sprawl, redevelopment, housing, segregation, transportation, crime, health care, air pollution. Prerequisite: 44:135 or consent of instructor.

44:150 Undergraduate Seminar for Geography Majors 2 s.h.
Participation in a term project and preparation of a documented report. Prerequisites: 44:108 and 44:138, or equivalents. Spring.

44:161 African Development 3 s.h.
Problems of economic, political and spatial integration in Africa; patterns and processes of economic development and nation-building. Same as 30:146, 45:162.

44:162 The Third World 3 s.h.
Geographical patterns and processes of underdevelopment; spatial implications of colonialism and neocolonialism; alternate concepts of spatial planning in the Third World.

44:165 The Changing World 3 s.h.
Conceptualization of the world as an increasingly

interconnected system; similarities and differences in the ways diverse regions are participating in the changing world.

44:167 The Geography of the Soviet Union 3 s.h.

44:170 The World of Wines 2 s.h.
Production, distribution and consumption of wines throughout the world with emphasis on quality of wine as related to landforms, soils, weather conditions; viticultural practices in the different grape-growing areas.

44:180 Field Techniques in Natural Environmental Problems arr.
Mapping and survey techniques as applied to natural resources; problems in resource evaluation and management in their field settings. Summer.

44:191 Energy in Contemporary Society 3 s.h.
Technical, legal, economic and behavioral issues in energy production, delivery and use; emphasis on cross-disciplinary implications of energy systems. Prerequisites: junior, senior, professional or graduate status. Same as 527:101, 12:114, and 91:191.

Courses for Graduates Only

44:200 Readings arr.
Graduate students who have interest in pursuing specific topics of their choice may do so by registering for supervised readings in geography. Prerequisite: consent of instructor.

44:201 Geographical Analysis I 1-4 s.h.
Four mini-courses on selected topics of current interest to faculty; focus is on methodological, theoretical, and substantive issues.

44:202 Geographical Analysis II 1-4 s.h.
Four mini-courses on selected topics of current interest to faculty. Continuation of 44:201.

44:206 Teaching College Geography 2 s.h.
Roles of college faculties; goals and objectives of geography teaching; alternative instructional methods; evaluation systems; emphasis on application in the college classroom.

44:208 Quantitative Analysis I 3 s.h.
Problems of drawing inferences from data in studies using simple measures; research design; commonly-used measures of statistical and spatial association; logic of statistical inference and hypothesis testing; simple correlation and regression analysis; introduction to computer modeling. Prerequisite: introductory statistics or consent of instructor.

44:209 Quantitative Analysis II 3 s.h.
Statistical and mathematical analysis in current geographical research with emphasis on problem formulation and research design; multiple correlation and regression; analysis of variance; testing causal models; selected topics in multivariate analysis, scaling and network analysis. A continuation of 44:208. Prerequisite: 44:208 or consent of instructor.

44:215 Political-Economic Analysis in Geography 2 s.h.
Theories of the political-economic organization of space at the subnational level, with an emphasis on public choice, social welfare, and collective decision-making approaches; locational conflict, philosophical and methodological issues in public policy analysis. Prerequisite: 44:201 or 44:202 or consent of instructor.

44:216 Behavioral Analysis in Geography 2 s.h.
Various behavioral model-building strategies pertaining to spatial behavior and spatial structure with emphasis on environmental perception approaches. Prerequisite: 44:208 or consent of instructor.

44:219 Stream Processes and Water Resources 1-3 s.h.
Same as 44:121, but for graduate students.

44:221 Advanced Landforms 2-3 s.h.
Recent problems and theoretical developments in selected geomorphic topics and regions.

44:226 Seminar: Transportation Planning Issues 3 s.h.
Process and policy considerations related to transportation planning; investigation of current issues and methodologies employed in transportation planning. Prerequisite: 44:111 or consent of instructor. Same as 102:226.

44:227 Geographic Information Systems 3 s.h.
Application of information system concepts to spatial analysis and planning; data processing of small-area data to support research and planning. Prerequisite: consent of instructor. Same as 102:227

44:230 Locational Analysis of Economic Behavior 2 s.h.
Classical theories for location of economic activities contrasted with alternate approaches of spatial analysis school of economic geography; contemporary efforts to develop behavioral models of decision making contrasted with mathematical programming and heuristic programming approaches to solutions of spatial allocation problems. Prerequisite: 44:130, 44:209 or consent of instructor.

44:236 Travel Behavior in Urban Areas 3 s.h.
Theoretical and conceptual basis of urban travel behavior; current models of travel behavior; interaction between intra-urban spatial structure and travel behavior; new research strategies and experimental behavior models helpful in gaining insight into urban travel behavior processes. Prerequisite: 44:208 or consent of instructor.

44:237 Urban Spatial Analysis 2 s.h.
Research issues, findings and methodologies in urban geography; spatial aspects of economic, social and political processes in urban settings; preparation of review papers.

44:261 Geographic Perspectives on Development 3 s.h.
Theoretical and empirical studies of the development process with special emphasis on spatial implications of socioeconomic changes attendant upon development. Prerequisite: 44:208 or consent of instructor.

44:275 Urban Growth in Developing Countries 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Same as 113:275, 6E:275, 42:275, 34:275, and 102:275.

44:280 Field Techniques in Physical Geography arr.
Sampling procedures and collection of field data in physical geography together with laboratory analysis of data.

44:300 Seminar in Applied Problems 4 s.h.
Geographic skills, knowledge and analytical methods needed to solve real world problems presented in a case studies format, including problems in human geography, locational analysis and human-environment interactions. Prerequisites: 44:206, 44:107, and 22C:7, or their equivalents.

44:306 Research Seminar: The Teaching of Geography arr.

44:308 Research Seminar: Quantitative Methods, Computer Methods and Modeling arr.

44:315 Research Seminar: Locational Analysis of Political Behavior arr.

44:316 Research Seminar: Space Perception arr.

44:318 Research Seminar: Pleistocene arr.

44:319 Research Seminar: Physical Geography arr.

44:320 Research Seminar: Natural Hazards and Problems arr.

44:321 Research Seminar: Urbanization and Environment arr.

44:323 Research Seminar in Natural Resources arr.

44:330 Research Seminar: Geographic Analysis of Economic Behavior arr.

44:331 Research Seminar: Location Theory arr.

44:335 Research Seminar: Urban arr.

44:336 Research Seminar: Urban Travel Behavior arr.

44:350 Research Seminar: Staff arr.

44:362 Research Seminar: Perspectives on Development arr.

44:380 Field Seminar arr.

44:406 Research: The Teaching of Geography arr.

44:419 Research: Physical Geography arr.

44:440 Research: Environment and Behavior arr.

44:441 Research: Locational Analysis arr.

44:442 Research: Models of Spatial Behavior arr.

44:450 Thesis arr.

Geology

Department chair: Richard A. Hoppin
Faculty: *professors* Brian Glenister, Richard A. Hoppin, Gilbert Klapper, George R. McCormick, Holmes Semken, Keene Swett, Sherwood Tuttle
emeritus professor William M. Furnish
associate professors Richard Baker, Robert S. Carmichael, Kenneth Clark, Lon Drake, Philip Heckel, Jeffry Schabilion
assistant professors Robert L. Brenner, C. Thomas Foster
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Degrees offered: B.A., B.S., M.S., Ph.D.

Geology is the basic study and practical application of all scientific disciplines as related to understanding the earth. Geological concerns include the earth's origin, its present appearance and character internally and at the surface, its alteration with time, the locating of economic and energy resources, and how man is changing the earth for future generations. The Geology Department has the customary subfields—mineralogy, petrology, stratigraphy, structural geology, paleontology, sedimentology, economic geology, geomorphology, environmental geology—and also includes applied geophysics, geochemistry, and paleobiology.

Career opportunities are available to professional geologists in industry (especially as related to the search for petroleum and minerals), teaching, urban planning, state and federal geological surveys, and government, resource, and research organizations. The master's degree is regarded by

most hiring agencies as the working degree in geology. However, an undergraduate degree is fully satisfactory in certain teaching, federal, and industrial situations.

Many of Iowa's geology graduates find employment with the petroleum industry in exploration geology and geophysics. Others continue in graduate school or take jobs with government or consevation agencies. Some intend to enter law, business, or other fields such as urban planning, environmental studies, engineering, archeology, science education, or oceanography as advanced areas. Geology is suited to all these.

The program at Iowa stresses the basic aspects of geology more than the engineering or agricultural phases of the discipline. The Department specializes in relating scientific thought to the study of the earth. Its resources include a major paleontology facility (invertebrate, vertebrate, palynology), a terminal link to the University Computer Center, the State Geological Survey within the Geology building, and research equipment for fields such as mineralogy, petrology (igneous, sedimentary, and economic), remote sensing, and exploration geoscience.

Geology majors receive at least an academic year's work in allied scientific areas—physics, chemistry, biology, and mathematics—in addition to a course in each major area of geology.

Each year more than 1,000 students enroll in Earth Science 11:23 Earth History and Resources and 11:24 Man and His Physical Environment, a team-taught, laboratory-lecture course designed to fulfill the College of Liberal Arts requirement for natural science core studies.

Other offerings for nonmajors include a lecture sequence for persons interested in a general survey of geology, and several advanced courses with few prerequisites—paleontology, geology of Iowa, evolution of the vertebrates, a planet in crisis, minerals and world affairs, geomorphology, oceanography, and use of native materials.

Undergraduate Programs

Students majoring in geology must meet the general requirements of the College of Liberal Arts. It is recommended that they satisfy the language requirement with French, German or Russian, and the social science requirement with approved courses in economics, geography and/or anthropology.

Bachelor of Science Degree

The Bachelor of Science professional program is designed primarily as preparation for graduate study and for employment in industry. Required courses in this program (12:5 and 12:6 are the preferred introductory courses for geology majors):

Geology Courses

12:5 Introduction to Geology	4 s.h.
(11:23 and/or 11:24 may substitute for 12:5)	
12:6 Evolution of the Earth	4 s.h.
12:41 Mineralogy	4 s.h.
12:52 Elementary Petrology	4 s.h.
12:113 Summer Field Course	6 s.h.
12:121 Principles of Paleontology	3 s.h.
12:191 Structural Geology I	4 s.h.
12:192 Structural Geology II	3 s.h.
Two elective geology courses	6 s.h.
Total	38 s.h.

Supporting Sciences

The geology major requires at least 10 semester hours of college mathematics, including a minimum of one semester of 22M:25 Calculus I or 22M:35 Engineering Calculus I. Computer science or statistics courses may be counted toward the 10-hour requirement. Additional math (22M:26 Calculus II, 22M:28 Calculus III; or 22M:36-37 Engineering Calculus II-III) is strongly recommended.

Eight hours of physics, eight hours of chemistry, and a one-semester lab course of college zoology or botany also are required.

Bachelor of Arts Degree

The B.A. program is designed to provide a general background in geology, with a broader choice of electives than in the B.S. program, for students who are not planning to become professional geologists. With appropriate coursework in education, the B.A. program provides a base for high school or community college teaching. A general background in geology and allied fields is also applicable to interests in such areas as conservation and environmental problems. Course requirements:

Geology Courses

12:5 Introduction to Geology	4 s.h.
(11:23 and/or 11:24 may substitute for 12:5)	
12:6 Evolution of the Earth	4 s.h.
12:41 Mineralogy	4 s.h.
12:121 Principles of Paleontology	3 s.h.
12:116 Field Trip (two sections)	4 s.h.
Geology electives	16 s.h.
Total	35 s.h.

Mathematics

Ten semester hours of university-level mathematics, which may include computer science or statistics.

Related Areas

Eight semester hours of chemistry, and recommended courses in other sciences and social sciences appropriate to the student's objectives.

Joint Programs

Joint programs can be arranged, typically with chemistry, physics, zoology, and anthropology.

Original Research

A junior or senior who is ready to pursue original research for credit may assist a faculty member or graduate student with a current research project, or initiate a small-scale project involving a combination of field, laboratory, and library investigation. Independent study is encouraged. Undergraduate classes have produced term reports which subsequently were published.

The Honors Program

A degree "with Honors" in geology is offered. Students in the Honors Program can elect a senior thesis.

Graduate Programs

Students planning to take graduate work in geology should have completed geology and supporting courses equivalent to those required of undergraduate geology majors at Iowa. Deficiencies may be remedied at the beginning of graduate study. 12:107

Geologic Orientation is required for all entering graduate students.

All graduate students in geology are required to perform teaching, research, or other appropriate services for the Department, as part of the degree program.

Prospective graduate students in geology should consult the "Rules and Regulations" in the "Graduate College" section of the *Catalog* for general admission and graduate study requirements.

The Master of Science Degree

The M.S. degree programs are designed to complete the student's broad, fundamental background in geology and the supporting sciences. They prepare the student for a professional career in geology, or for more advanced and specialized studies—although in certain situations and with faculty approval the student may pursue a specialized program at the master's level.

Entering graduate students are assigned to a general graduate adviser. Before the end of the second semester, the student should have selected a research area and related thesis topic. The chair then approves a thesis adviser and two additional faculty members, who form the student's advisory committee. The student is responsible for getting the committee's approval of a suitable program of coursework, and for satisfactory development of research plans as outlined in a thesis proposal which is submitted for departmental approval.

The degree requires at least 30 semester hours of credit in graduate level coursework, including not more than eight semester hours of thesis and research credit, and at least 24 hours in residence at Iowa.

Master's degree candidates complete at least one-half of the Ph.D. language and tool requirements as part of the master's program. Coursework taken to satisfy these requirements does not count toward the semester-hour requirements for the degree.

To qualify for the final master's examination, the candidate must have at least a 2.75 (A=4) grade-point average on University of Iowa graduate courses offered toward a degree.

The Master of Science Degree with Thesis

Students are encouraged to select thesis topics involving a variety of geological subdisciplines and scientific skills. Research topics might include field work or mapping, laboratory experiments, analytical work, or some combination.

The Master of Science Degree without Thesis

Relatively few students are encouraged to pursue this program, which requires that the applicant have approximately three months' experience working under supervision of a professional geologist, or equivalent experience in some phase of geologic activity.

If possible the student should receive prior faculty permission to apply the experience toward the degree.

The student must submit a written report on the activity and on the geologic principles it involved and its value and broader applications and implications. No college credit is granted for this activity.

The M.S. degree without thesis requires at least 38 semester hours of graduate coursework, of which at least eight hours must be earned in other departments of the University.

The faculty in Geology may also require the students to submit a formal scientific report dealing with an appropriate subject or project. Credit may be granted for this report.

The final examination covers coursework and work done in lieu of the thesis.

The Master of Arts in Teaching (Earth Science)

This program enables students to combine certification to teach secondary school with participation in a specialized graduate curriculum. Awarded by the College of Education, the M.A.T. degree requires at least 20 semester hours of graduate study in professional education and at least 18 hours of graduate coursework in earth science.

The Doctor of Philosophy Degree

The Doctor of Philosophy degree in Geology requires at least 72 semester hours of graduate coursework, including at least two full-time semesters in residence beyond the first 24 hours of graduate study.

Departmental language and tool requirements for the Ph.D. degree may be met either by achieving competence in two languages or in one language and one tool, or by achieving proficiency in one language.

Competence is normally achieved by satisfactory completion of a one-year sequence of appropriate courses, proficiency by satisfactory completion of a two-year sequence.

French, German, and Russian are languages which meet departmental requirements; statistics and computer science are suitable tool areas. In exceptional circumstances the faculty may approve other languages or tool areas.

Courses in such related disciplines as botany, chemistry, physics and zoology are not regarded as satisfying tool requirements, although they may provide indispensible background for the various areas of geological specialization.

Coursework taken to satisfy language and tool requirements may not be applied to credit requirements for the degree.

These are minimum requirements:

Satisfaction of course requirements for the M.S. degree in geology at Iowa. Where appropriate, additional work in one area may be approved as satisfying requirements in another.
An appropriate graduate course in another discipline. Courses crosslisted between Geology and other departments are not generally considered to meet this requirement.
At least 24 semester hours of graduate coursework, exclusive of credits for dissertation research and beyond coursework applied toward the M.S. degree.
The comprehensive examination covers—in depth—all subdivisions of one major field and one subdivision in each of three other major fields. It is also presumed that the doctoral candidate is proficient in the basic elements of general geology, as presented by current elementary textbooks. These are the major and minor fields:

Economic Geology
Petroleum
Economic Deposits
Mineral Economics

Petrology-Mineralogy
Mineralogy
Igneous and Metamorphic Petrology
Experimental Petrology

Structural Geology
Geotectonics
Structural Analysis

Remote Sensing

Geophysics
Exploration Geophysics
Solid-Earth Geophysics
Rock Properties

Stratigraphy
Physical Stratigraphy
Biostratigraphy
Depositional Environments

Sedimentary Petrology
Sedimentation
Sandstone and Carbonate Petrology
Physical Stratigraphy

Pleistocene Studies
Pleistocene Geology
Vertebrate Paleontology
Palynology

Paleontology
Paleobotany
Paleozoology
Biostratigraphy

Geomorphology
General Geomorphology
Glacial and Pleistocene
Remote Sensing

Environmental Geology
Ground Water
Remote Sensing
Ecology

Other Minor Subjects
Botany
Zoology
Chemistry
Physics
Materials Engineering
Geography
Hydraulics
Archeology-Anthropology
Science Education
Others

Cooperative Activities

The Department has joint professorships with the Iowa Geological Survey and the Department of Botany and students sometimes work on projects for the Survey.

There is also cooperation between the Geology, Geography, Anthropology, Chemistry, Botany, Zoology, and Physiology and Biophysics departments in service, expertise, joint instruction and equipment.

Field Trips

Field trips are integral parts of several courses in geology. Weekend general-interest events are frequent. Iowa City is situated in the midst of the richly fossiliferous Paleozoic bedrock. Marine and terrestrial fossil assemblages, extensive reefs, and unique geode sites are available within a few hours' drive. All four Pleistocene glaciations are represented in Iowa and each offers distinctive landforms and fossil assemblages.

Spring recess provides time for longer trips which are available to all geology students. In recent years these have included the Grand Canyon, the Florida Keys, the southern Appalachians, the Big Bend Region of Texas and the Ozarks. Advanced seniors and graduate students visit Colorado, Ontario, Kansas, Oklahoma and California.

Courses

Primarily for Undergraduates

12:1 Lectures in Earth History and Resources **2 s.h.**
Not open to students who have had 11:23, 12:3, 12:5 or 12:6. See 12:2 for description.

12:2 Lectures in Man and His Physical Environment **2 s.h.**
Not open to students who have had 11:24, 12:4 or 12:5. 12:1 and 12:2 examine ancient and modern environments on and within earth and processes by which they evolved; evolution of organisms and man's current use and misuse of present environments.

12:3 Principles of Physical Geology **2 s.h.**
Introductory course focusing on processes that have generated and currently are altering our physical environment; composition and inhomogeneity of the earth from atomic to planetary level, discussed relative to man's resource requirements; processes of weathering, erosion, rock deformation,volcanism, mountain building, earthquakes, geomagnetism, and continental drift considered; open to all who have not had previous college courses in geology or earth science.

12:4 Principles of Historical Geology **2 s.h.**
Investigation of the principles and procedures which enable geologists to organize five billion years of earth history; emphasis on geologic time, nature of the geologic record, fossils as interpretive tools, physical and biological evolution of the earth during the past 600 million years, origins of modern landscapes and geological resources, especially fuels. Open to any student who has not had a previous college course in historical geology.

12:5 Introduction to Geology **4 s.h.**
Lectures and laboratories; topics include rocks and minerals, weathering, soils, erosion, landforms, glaciation, mountain building, earthquakes and interior of earth; several field trips offered. Recommended for science majors and interested nonscience majors; not open to students who have had 11:23, 12:1 or 12:3.

12:6 Evolution of the Earth **4 s.h.**
Lectures, laboratories, discussions and field trips, treating the observed and interpreted features of the earth in historical perspective. Topics include: origin of the earth, history and evolution of the earth's structure, dating of geological events, nature of the fossil record, an introduction to minerals, rocks, fossils and methods of geologic study. Prerequisite: 12:5 (preferable), 11:23 or 12:3; no prior registration in 12:4.

12:9 Geology of Iowa **2 s.h.**
Lecture, library, and field investigation of the sequence of events in geologic history responsible for the landscape, substrates and geologic resources of the state. Recommended for students with a previous course in geology or earth science.

12:10 Honors Thesis in Geology **arr.**
Prerequisite: consent of the Department.

12:16 Field Trip **2 s.h.**
Seven to ten days during spring recess in areas of geologic interest: carbonates of Florida; northern Arizona; Big Bend, Texas, region; southern Appalachians; Ozarks. May be repeated. Prerequisite: consent of instructor.

12:41 Mineralogy **4 s.h.**
Introductory study of minerals, stressing crystallography, chemical properties, phase relations and identification. Prerequisites: college earth science or geology, and introductory chemistry, which may be taken concurrently.

12:52 Elementary Petrology **4 s.h.**
Lecture and laboratory dealing with principles of petrology and hand specimen petrography for igneous, sedimentary and metamorphic rocks. Prerequisite: 12:41.

For Undergraduates and Graduates

12:103 Physical Geology **2-3 s.h.**
Introductory course focusing on processes which have generated and currently are altering our physical environment; composition and inhomogeneity of the earth from atomic to planetary level, discussed relative to man's resource requirements; processes of weathering, erosion, rock deformation, volcanism, mountain building, earthquakes; geomagnetism and continental drift. Open to all who have not had previous college courses in geology or earth science.

12:104 Historical Geology **2-3 s.h.**

12:107 Geologic Orientation **1 s.h.**
Required course for all entering graduate students. Comprises academic orientation, a review of degree requirements and programs; geological orientation, a field survey of local geology; and geotechnical skills, the introduction to use of specialized facilities. Prerequisite: graduate status or consent of instructor.

12:108 Introduction to Oceanography **2 s.h.**
Survey of descriptive, chemical, physical, biologic and geologic aspects of the world ocean. Familiarity with basic principles of chemistry, biology, physics and earth science is desirable.

12:109 Geology of Iowa **2-3 s.h.**
Lecture, library, and field investigation of the sequence of events in geologic history responsible for the landscapes, substrates, and geologic resources of the state. Recommended for students with a previous course in geology or earth science; not open to students who have had 12:9.

12:110 Geologic Remote Sensing **3 s.h.**
Remote sensing of the earth's surface and features, from aircraft and satellites; airphoto interpretation; remote sensing systems, methods, and data analysis using the electromagnetic spectrum, including ultraviolet, visible, infrared, and microwave radiation; application of remote

sensing to geologic and environmental problems; laboratory exercises. Prerequisites: college geology and physics, or consent of instructor. Nonmajors welcome.

12:111 Methods of Geological Instruction arr.
Instructional methods utilized in elementary geology; literature review of presentation techniques; instructional duties in an elementary laboratory. May be repeated. Prerequisite: consent of instructor.

12:113 Summer Field Course 6 s.h.
Training in description and mapping of rock units and geologic structure in Wasatch and Uinta Mountains, Park City, Utah. Prerequisites: 12:41, 12:52, 12:112 and 12:191.

12:114 Energy in Contemporary Society 3 s.h.
Technical, legal, economic and behavioral issues in energy production, delivery and use; emphasis on cross-disciplinary implications of energy systems. Prerequisite: junior, senior, professional, or graduate status. Same as 44:191, 91:191, 527:101.

12:116 Field Trip 2 s.h.
Seven to ten days during spring recess, in areas of geologic interest: carbonates of Florida; northern Arizona; Big Bend, Texas, region; southern Appalachians; Ozarks. May be repeated. Prerequisite: consent of instructor.

12:119 Directed Study arr.
May be repeated. Prerequisite: consent of the Department.

12:120 Practical Paleontology 2 s.h.

12:121 Principles of Paleontology 3 s.h.
Nature, origin and use of fossils; taxonomic principles, species concepts, zoological nomenclature; evolution of selected animal groups; field and laboratory study of taxa of greater geologic significance. Prerequisite: college earth science or geology or consent of instructor. Open to graduates in zoology or botany without prerequisites.

12:122 Evolution of the Vertebrates 2 s.h.
Lecture sequence on major features of vertebrate evolution as recorded in the geologic record; taxonomic, stratigraphic, and paleoecological concepts of selected taxa. Prerequisites: introductory geology or zoology and junior standing.

12:123 Vertebrate Osteology 2 s.h.
Laboratory designed to familiarize the student with basic skeletal structure of vetebrates; emphasis on mammals and on identification and interpretation of remains from paleontological and archeological sites. Enrollment limit. Prerequisites: introductory geology or zoology and junior standing.

12:124 Invertebrate Paleontology 4 s.h.
Lecture, laboratory and field review of morphology, taxonomy, evolution and ecology of all significant macroscopic invertebrates. Prerequisites: 12:121 and college zoology, or consent of instructor.

12:125 A Planet in Crisis 2 s.h.
Critical review, scientifically based, of the imbalance of earth's resources and human population; includes basic ecology, population, resources and pollution. Intended for general upperclass students, or nonscience graduate students. Same as 37:125.

12:127 Paleobotany 4 s.h.
Phylogenetic study of plants using fossil evidence; paleobotanical techniques, economic applications in coal and petroleum industries; lectures, laboratory, field trips. Prerequisite: introductory botany or geology. Same as 2:120.

12:128 Quaternary Palynology 2 s.h.
Nature, origin, and use of pollen and spores in Quaternary time; field and laboratory study of pollen-bearing deposits; application to geological, ecological, and archeological problems. Lecture, laboratory, and field trips. Prerequisite: college geology or botany. Same as 2:121.

12:129 Paleopalynology 2 s.h.
Lecture and laboratory survey of pollen and spores through geologic time. Morphology, taxonomy, paleoecology, and biostratigraphy of pollen and spores. Prerequisite: college geology or botany. Same as 2:122.

12:132 Sedimentology 3 s.h.
Lecture, laboratory and field course treating the processes of weathering, transportation, deposition and lithification which produce detrital, biochemical and chemical sedimentary rocks. Prerequisites: physical and historical geology.

12:135 Depositional Environments 1, 3 s.h.
Survey of modern patterns of sedimentation oriented toward interpretation of depositional environments of ancient sedimentary rocks and deciphering of resulting stratigraphic patterns. Prerequisites: 12:121, 12:132, 12:161, or consent of instructor.

12:141 Optical Mineralogy 3 s.h.
Theory and practice of mineral study with polarizing microscope. Prerequisites: 4:2 or 4:4, 22M:5, 29:2 or 29:8.

12:143 X-Ray Crystallography 3 s.h.
Theory and practice of powder method, single crystal method, X-ray fluorescence, space group symmetry; application to geologic problems. Offered in alternate years. Prerequisites: college physics and mineralogy.

12:144 Gemology 3 s.h.

12:145 Crystal Chemistry 3 s.h.
Principles of solid state geochemistry as applied to important mineral groups, notably sulphides, oxides, carbonates and silicates, with aim of understanding genesis. Offered alternate years. Prerequisite: consent of instructor.

12:152 Thin Section Petrography 3 s.h.
Laboratory course in description, classification and genesis of igneous, sedimentary and metamorphic rocks. Prerequisite: 12:141.

12:154 Thermodynamics and Geochemistry 3 s.h.
Principles of thermodynamics, aqueous geochemistry, and phase equilibrium, fundamental to the investigation of igneous, sedimentary, and metamorphic processes. Recommended: one year of chemistry, one year of calculus. Prerequisite: 12:52 or consent of instructor.

12:155 Geostatistics 2 s.h.
Application of statistics to geological problems. Recommended: one semester of statistics. Same as 22S:105.

12:156 Scanning Electron Microscopy 2 s.h.
Prerequisite: consent of instructor. Same as 2:156, 37:156 and 60:274.

12:161 Principles of Stratigraphy 3 s.h.
Genesis of sedimentary rocks, geologic time, stratigraphic nomenclature, correlation, tectonic influences, and stratigraphic field methods are topics covered. Prerequisite: previous course in geology.

12:166 Geohydrology 3 s.h.
Principles of ground water flow systems, including hydrology, geometry and chemical properties and their modification by man. Prerequisites: college geology, chemistry, physics and consent of instructor.

12:171 Geomorphology 3 s.h.
Topical, systematic, process-oriented review of significant geomorphic theories, classical and modern. Prerequisite: college earth science or geology.

12:172 Glacial and Pleistocene Geology 3 s.h.
Lectures emphasize processes by which glacial and periglacial materials and landscapes evolve; laboratory exercises are an introduction to specific regional examples. Prerequisite: a sound introduction to physical geology or physical geography. Offered fall of odd-numbered years.

12:173 Quaternary Environments 3 s.h.
Seminar on use of stratigraphy, palynology, biogeography, vertebrate and invertebrate fossils, glacial and periglacial deposits, paleoclimatology, dendroclimatology and other studies to interpret Quaternary environments. May be repeated. Prerequisite: one of 12:122, 12:128, 12:172 or college archeology.

12:174 Applied Geomorphology 3 s.h.
Lab-oriented approach to study of evolution of selected materials and geomorphic features. Prerequisite: 12:171 or consent of instructor.

12:175 Cenozoic Mammals 3 s.h.
Identification of micromammals and interpretation of paleoenvironments. Prerequisite: 12:122 or consent of instructor.

12:177 Native Materials and Man 3 s.h.
Practical applications of geology including: water supplies, shallow wells, septic systems, small dams, soil cements and other construction materials, ceramic sources, erosion and conservation. Suitable for interests in homesteading, Peace Corps, environmental applications. Offered fall of even-numbered years. Prerequisite: introductory physical geology or geography.

12:180 Solid-Earth Geophysics 2 s.h.
General geophysics: Earth's interior, composition, structure, dynamic character, and physical properties; earthquakes and seismology, gravity and magnetic fields, heat flow, radioactivity and age dating, probing the deep interior. Prerequisites: college geology and an introductory course in physics, or consent of instructor.

12:181 Exploration Geophysics 3 s.h.
Techniques used in geophysical exploration for oil and gas, minerals, groundwater, and subsurface structure; gravity, magnetic, seismic, electrical methods, and well logging. Lab exercises and use of field equipment. Prerequisites: 12:180, or college geology, physics, and mathematics, or consent of instructor.

12:182 Principles of Economic Geology 4 s.h.
Principles of formation, distribution and economic utilization of metallic and nonmetallic mineral processes of formation deposits. Field trip required. Prerequisites: 12:52 and 12:191; 12:152 recommended.

12:183 Principles of Mineral Economics 2-3 s.h.
Mineral resource distribution, exploitation, use and conservation; role of mineral resources in regional, national and international development. Prerequisite: college geology or economics.

12:184 Economic Geology of Fuels 3 s.h.
Origin, distribution, use and economics of energy resources exclusive of petroleum. Field excursion required. Prerequisite: 12:182 or 12:183.

12:185 Opaque Mineral Microscopy 2 s.h.
Polished surface preparation of metallic, ceramic, coal specimens; optical properties, etch and microchemical tests, scanning electron microscope and microprobe applications and conventional photomicrography. Prerequisites: 12:41, 12:141.

12:186 Petroleum Geology 3 s.h.
Geologic processes which affect petroleum generation, migration, trapping, and accumulation will be stressed; survey of geological, geochemical, and geophysical exploration and production techniques will be included along with case studies. Prerequisite: 12:161, or 12:191 or instructor's permission.

12:191 Structural Geology I 4 s.h.
Rock deformation; description and classification of faults, folds; introduction to tectonics. Prerequisite: 12:52, 22M:35, or 22M:25.

12:192 Structural Geology II 3 s.h.
Solution of structural problems by descriptive geometry and

stereographic projection; structural interpretation of geologic maps and aerial photographs; introduction to field methods. Prerequisite: 12:191.

Primarily for Graduates

12:210 Seminar in Geologic Remote Sensing 2 s.h.
Review of current literature and research; detailed study of remote sensing techniques, including field and laboratory experiments. Prerequisites: 12:110 and consent of instructor.

12:221 Advanced Invertebrate Paleontology 4 s.h.
Morphology, taxonomy, chronology and ecology of selected macroscopic invertebrates. Involves independent research for major term paper. Prerequisites: 12:121, 12:161, and college zoology, or consent of instructor.

12:222 Micropaleontology 4 s.h.
Morphology, taxonomy and evolution of selected groups of microfossils. Prerequisite: 12:121, 12:161, college zoology, or consent of instructor.

12:223 Seminar: Paleontology 3 s.h.
May be repeated. Prerequisites: 12:222 and consent of instructor.

12:228 Advanced Palynology 2-3 s.h.
Literature review of pollen record of selected geological periods. Laboratory involves collection, processing and identification of a suite of samples from one or more geological periods, followed by paleoenvironmental and biostratigraphic interpretation. Prerequisites: 12:126 or 12:121 and consent of instructor.

12:233 Sedimentary Petrology 4 s.h.
Research-oriented field, laboratory and seminar course treating textural, structural, compositional, depodiagenetic aspects of sedimentary rocks, emphasizing carbonates and sandstones. Prerequisites: optical mineralogy and sedimentology/stratigraphy.

12:235 Seminar in Depositional Environments 1-2 s.h.
Advanced topics in interpretation of depositional environments of sedimentary rock units. Prerequisite: 12:135.

12:240 Mineralogy Seminar 3 s.h.

12:251 Igneous Petrology 3 s.h.
Lecture, seminar and laboratory course; fall of even-numbered years; genesis of igneous rocks from fundamentals of thermodynamics, experimental information and geologic observations. Prerequisites: 12:52, 12:141, and physical chemistry or 12:154.

12:255 Metamorphic Petrology 3 s.h.
Lecture, seminar and laboratory; fall of odd-numbered years; genesis of metamorphic rocks from fundamentals of thermodynamics; experimental information and geologic observations. Prerequisites: optical mineralogy, elementary petrology and physical chemistry or 12:154.

12:261 Regional Stratigraphy 3 s.h.
Seminar format covering contemporary stratigraphic concepts in the light of new developments in global tectonics, and detailed stratigraphic analyses of class-selected sedimentary basins and areas. Prerequisite: 12:161.

12:262 Mesozoic Stratigraphy and Sedimentation 2 s.h.
Analyses of selected Mesozoic basins and seaways around the world with emphasis on depositional styles and stratigraphic problems. Offered fall of odd-numbered years. Prerequisite: 12:161.

12:263 Biostratigraphy 3 s.h.
Principles and methods of biostratigraphic correlation, with emphasis on evaluation of current techniques. Prerequisites: 12:161 and 12:222.

12:271 Advanced Geomorphology 3 s.h.
Prerequisite: 12:171 or consent of instructor.

12:280 Seminar Geophysics 1-2 s.h.
Discussion and investigation of geophysics topics such as high-pressure geophysics, exploration geophysics, physical properties of rocks, computer processing of data, and remote sensing.

12:281 Gravity and Magnetic Exploration 3 s.h.
Basis, techniques, and use of the gravity and magnetic methods of geophysical prospecting. Associated practical exercises, lab work, computer use, and field surveys. Offered alternate years. Prerequisite: 12:181.

12:282 Seismic and Electrical Exploration 3 s.h.
Basis, techniques, and use of the seismic reflection and refraction, electrical, and electromagnetic methods of geophysical prospecting. Associated practical exercises, lab work, computer use, and field surveys. Offered alternate years. Prerequisite: 12:181.

12:284 Seminar: Economic Geology 2 s.h.
Exploration, development and evaluation of mineral deposits. Prerequisites: 12:182 or 12:184; consent of instructor.

12:286 Seminar in Subsurface Geology 3 s.h.
Survey of techniques used to solve subsurface geological problems, including lithologic sample analysis, well-log analysis and seismic stratigraphy; applicability of techniques will be demonstrated with case studies and problem-solving exercises. Prerequisite: 12:186 or 12:161 or consent of instructor.

12:288 Rock Magnetism and Paleomagnetism 2 s.h.
Geomagnetism and its applications; earth's magnetic field, remanent magnetization, magnetic properties of minerals and rocks, paleomagnetism, experimental procedures; uses in continental drift, stratigraphic correlation, structural geology. Offered alternate years. Prerequisite: college geology or materials science; 12:180 recommended.

12:292 Geotectonics 3 s.h.
Origin of continents, oceans and orogenic belts, based on geophysical, geochemical and geologic evidence. Offered alternate years. Recommended: one year of calculus. Prerequisites: 12:180, 12:191.

12:293 Advanced Structural Geology 4 s.h.
Mechanics of behavior of rock materials and physical processes in geology; offered alternate years. Prerequisite: one year of calculus.

12:296 Seminar: Structural Geology 1-2 s.h.
Offered alternate years. Prerequisite: consent of instructor.

12:300 Research: Summer Field and Laboratory arr.
May be repeated.

12:301 Research: General Geology arr.
May be repeated.

12:315 Research: Ground Water arr.
May be repeated.

12:320 Research: Paleontology arr.
May be repeated.

12:321 Research: Micropaleontology arr.
May be repeated.

12:330 Research: Sedimentology and Sedimentary Petrology arr.
May be repeated.

12:340 Research: Mineralogy arr.
May be repeated.

12:350 Research: Petrology arr.
May be repeated.

12:360 Research: Stratigraphy arr.
May be repeated.

12:370 Research: Geomorphology and Pleistocene Geology arr.
May be repeated.

12:380 Research: Economic Geology arr.
May be repeated.

12:385 Research: Geophysics arr.
May be repeated.

12:386 Research: Petroleum Geology arr.
May be repeated.

12:390 Research: Structural Geology arr.
May be repeated.

12:395 Research in Geologic Remote Sensing arr.
May be repeated.

German

Department chair: Edward Dvoretzky
Faculty: *professors* Edward Dvoretzky, James P. Sandrock, John A.A. ter Haar
professor emeritus Fred L. Fehling
associate professors Ford B. Parkes, Richard M. Runge, Ingeborg H. Solbrig
associate professor emeritus Milton Zagel
assistant professors Judith P. Aikin, Wolfgang Ertl, James P. Pusack
Degrees offered: B.A., M.A., Ph.D.

The primary function of the Department of German is to transmit to American liberal arts students knowledge of the language and literature, the civilization and culture traditionally designated as German, as, for example, in East and West Germany, Austria, and Switzerland.

University graduates with a degree in German frequently enter the teaching profession. They may also find positions in government, foreign service, and commercial enterprise, where their specialized knowledge of the language and literature, the history and culture of Germany is indispensable.

The Undergraduate Program

Advanced Placement

Normally, for purposes of tentative placement, each year of high school language instruction is considered equivalent to one semester on the college level. However, if a student is not sufficently prepared for the level of work in the course suggested by this formula, he or she may register for any course with a lower number. Proficiency placement exams may be given to students for whom the regular procedure does not seem suitable. In addition to the general requirements of the College of Liberal Arts (see "College of Liberal Arts"), students majoring in German are normally required to

complete a minimum of 24 semester hours of coursework in the Department beyond the basic program. The following course sequence or the equivalent is required of majors who have had no previous experience with the German language:

Basic Program

First and Second Year

13:11 First-Semester German	3-4 s.h.
13:12 Second-Semester German	3-4 s.h.
13:21 Third-Semester German	3 s.h.
13:22 Fourth-Semester German: Reading	3 s.h.
13:23 Fourth-Semester German: Elementary Composition and Conversation	3 s.h.

(13:22 and 13:23 may be taken concurrently, if desired, or in either order.)

Third Year

13:31 Introduction to Modern German Literature I	3 s.h.
13:32 Introduction to Modern German Literature II	3 s.h.
13:33 Intermediate Composition and Conversation	3 s.h.
13:34 Intermediate Composition and Conversation	3 s.h.

(13:31 and13:32 must be taken in sequence; 13:33 and 13:34 may be taken in either order and concurrently with 13:31 and 13:32.)

Fourth Year

13:101 Advanced Composition and Conversation	3 s.h.
13:105 German Cultural History	3 s.h.
13:111 Survey of German Literature	3 s.h.
13:112 Survey of German Literature	3 s.h.

(13:111 and 13:112 may be taken in either order.)
All courses, with the exceptions noted above, are to be taken in sequence after initial placement, unless a variation in the sequence is approved by the faculty.

Students who intend to go on for an advanced degree are encouraged to add 13:103 German Phonology (three semester hours) to the above.

German majors, graduate as well as undergraduate, are urged to supplement their degree programs with relevant courses in German history, philosophy, etc.

A student with native proficiency in German may declare German only as a second major and is expected to complete a full first major in a subject in which he or she has no such obvious advantage over his or her peers.

Teacher Certification

Because the College of Education requirements for teacher certification are subject to change and could conflict at times with the sequential requirements of the major in German, it is imperative that the student consult with the Department chair or undergraduate adviser to help ensure the successful completion of the certification program.

The Teaching Minor

In addition to the basic program of the first and second year, these courses or their equivalents constitute a teaching minor in German:

13:31 Introduction to Modern German Literature I
13:32 Introduction to Modern German Literature II
13:33 Intermediate Composition and Conversation
13:34 Intermediate Composition and Conversation
13:101 Advanced Composition and Conversation

Honors in German

German majors of junior or senior standing with a grade-point average of at least 3.0 overall and 3.5 in German may enroll in this program. During the junior and senior years the Honor student in German is expected to engage in extra readings, discussions, and the writing of a term paper (if feasible) for each of the courses in which he or she is enrolled. A senior essay, written under the supervision of a faculty member, and a comprehensive oral examination terminate the program.

Special Facilities

Students have the opportunity to improve their comprehension and command of German by working with recorded materials in the Language Media Center. Students may also benefit from our new Computer-Assisted Instruction program.

An extensive collection of works and periodicals in the University Library facilitates research in all major areas of German literature and Germanic linguistics at all levels of study.

The Foreign Language House is available to undergraduate and graduate students as an on-campus housing option.

Foreign Study

The Department of German participates in the Regents' Summer Program in Austria. Sponsored by the three Iowa Regents universities, this program is open to students of all disciplines and is designed to provide a sound linguistic, cultural and academic experience to all participants.

A three-week session is conducted at St. Radegund, near Graz, Austria. Instruction in both language and culture is provided on three levels—intermediate, advanced, and very advanced. A second four-week session is held in Vienna, where faculty of the International University at the University of Vienna conduct morning classes daily, again on several levels. An optional cultural tour of Germany concludes the program.

To participate, the student must be admitted to one of the three Iowa Regents universities for the summer session. Applicants should have a good basic knowledge of German—normally two years of college-level German or the equivalent. Students with less than two years may be accepted with the approval of the campus coordinator. Graduate students are eligible to apply. All students are expected to speak only German while participating in the program.

Tuition grants are available for qualified applicants.

For further information, write to the Department of German.

Financial Aid

Teaching assistantships and tuition scholarships are available for qualified graduate students. The Department awards the Wilson and the Funke prizes to students of distinction.

Graduate Study Requirements

Master of Arts Degree with Thesis

Graduate students of German who demonstrate an interest in and potential for productive scholarship and who plan to continue to the doctorate should elect the program with thesis. The thesis program requires a minimum of 30 semester hours, or equivalent, of graduate-level work and fulfillment of other requirements of the Department of German and the Graduate College (see "Graduate College"). If the student has not completed major courses, or equivalents, in the Department's undergraduate program, he or she will include them along with the courses required for the Master of Arts. Under some circumstances, the candidate may qualify for graduate credit for such makeup work.

In consultation with the graduate adviser, the student should select courses which represent a balanced approach to the field. Some courses may be required of all graduate students.

With the graduate adviser's approval, some of the 30 semester hours required for the degree may be taken outside the Department, in such related subjects as philosophy, history, linguistics, or other languages.

Normally two semester hours of credit may be received for satisfactory completion of the thesis. The thesis may be either linguistic or literary, and is subject to the approval of the faculty. A student planning to continue to the Ph.D. degree is expected to write a thesis.

Before the M.A. exam can be administered—usually after acceptance of the M.A. thesis—the candidate must show a competence level in a foreign language other than German equivalent to two years of college study or four years of high school study, with a grade of "B" or higher.

M.A. Degree Without Thesis

A graduate student who desires his or her program to be oriented in the direction of optimum preparation for secondary school teaching, government service, translation, etc., may elect the one without thesis. This program requires a minimum of 38 semester hours of coursework and leads to a terminal degree. The same course requirements outlined for the M.A. with thesis apply to candidates for the M.A. without thesis; however, students in this program should, with the approval of the graduate adviser, select those courses which will best prepare them for their chosen career.

Doctor of Philosophy Degree

The Ph.D. degree is awarded upon the satisfactory completion of a minimum of 72 semester hours of graduate credit and fulfillment of other requirements of the Department of German and the Graduate College (see "Graduate College"), with a concentration in either Germanic linguisitcs or German literature.

Credit received toward the M.A. degree is normally applied to the Ph.D. The remainder of the program is planned by the candidate in consultation with the graduate adviser in such a way as to ensure satisfactory balance and concentration. The student may earn up to 12 additional semester hours of credit for satisfactory completion of the Ph.D. dissertation. Graduate courses outside the Department in related subjects may be counted toward the degree with the approval of the graduate adviser. Wherever possible, the Department will afford the opportunity and privilege to deserving graduate students to gain valuable teaching experience under supervision by making teaching assistantships available.

A candidate concentrating in literature must demonstrate a reading knowledge of French and of another language which his or her adviser certifies is pertinent to the student's research interests. For doctoral candidates in Germanic linguistics, a reading knowledge of French or Russian and of a modern Scandinavian language or Dutch is required. Competence in these languages may be demonstrated by two years of college study or four years of high school study, with a grade of "B" or higher, or through testing. The requirements must be met before the comprehensive exams can be administered.

Courses

Courses in Translation

Of the courses offered by the Department, the following are in translation: 13:17, 13:104, 13:108, 13:123, 13:137, 13:154, 13:173, 13:182, and 13:183. The titles, semester hours of credit, and descriptions of these courses may be found in the complete course listings which follow.

Primarily for Undergraduates

13:10 German and Germany for Travelers **2 s.h.**

13:11 First-Semester German **3-4 s.h.**
Student has the option of taking either (a) *Reading Approach:* emphasis on reading and basic structure of the language (3 s.h.), or (b) *Oral-Aural Approach:* emphasis on learning the grammar through listening and speaking, with one additional hour of language laboratory per week (4 s.h.).

13:12 Second-Semester German **3-4 s.h.**
Continuation of 13:11, with same option of either approach. Greater emphasis on vocabulary building. Prerequisite: 13:11 or equivalent.

13:13 Intensive Elementary German **6 s.h.**
Combines normal first- and second-semester courses. Additional hours of language laboratory will be required. Undergraduates only.

13:17 German Heroic and Erotic Literature of the Middle Ages **4 s.h.**
Masterpieces of this period, including *Parzifal*, the *Nibelungenlied*, and *Tristan*, read in English translation; satisfies second-semester core requirement in literature; also designed for letters majors and other interested undergraduates. Same as 11:17.

13:21 Third-Semester German **3 s.h.**
Basic structure of German language reviewed; emphasis on exact reading, basic conversation and composition. Prerequisite: 13:12 or equivalent.

13:22 Fourth-Semester German: Reading **3 s.h.**
Standard fourth-semester course; satisfies foreign language requirement for B.A. degree; reading of short but representative literary works. A student who has had all three units of the basic course sequence (13:11, 13:12, and 13:21 or equivalents) has the option of taking either 13:22 or 13:23 for his or her fourth semester. 13:22 and 13:23 in no way duplicate each other, so they may be taken concurrently or in either order for full credit. Prerequisite: 13:21 or equivalent.

13:23 Fourth-Semester German: Elementary Composition and Conversation **3 s.h.**
Also satisfies foreign language requirement for B.A. degree; recommended for students who want further training in active use of the language; emphasis on writing compositions, carrying on conversations in German, etc. A student who has had all three units of the basic course sequence (13:11, 13:12, and 13:21 or equivalents) has the option of taking either 13:22 or 13:23 for his or her fourth semester. 13:22 and 13:23 in no way duplicate each other, so they may be taken concurrently or in either order for full credit. Prerequisite: 13:21 or equivalent.

13:25 Intensive Second-Year German **6 s.h.**
Combines normal third- and fourth-semester courses. Emphasis on speaking as well as reading. Additional hours of language laboratory will be required. Undergraduates only.

13:31 Introduction to Modern German Literature I **3 s.h.**
Reading and discussion of representative German authors whose works influence modern times. Prerequisite: 13:22 or equivalent.

13:32 Introduction to Modern German Literature II **3 s.h.**
Continuation of 13:31. Prerequisite: 13:31 or equivalent.

13:33 Intermediate Composition and Conversation **3 s.h.**
Recommended for students who intend to improve their active command of the language in reading, speaking, and writing. 13:33 and 13:34 may be taken in either order, but not concurrently. Prerequisite: 13:23 or 13:25 or equivalent.

13:34 Intermediate Composition and Conversation 3 s.h.
Recommended for students who intend to improve their active command of the language in reading, speaking, and writing. 13:33 and 13:34 may be taken in either order, but not concurrently. Prerequisite: 13:23 or 13:25 or equivalent.

13:90 Honors Program in German arr.

For Undergraduates and Graduates

(Some of the courses listed below are offered at irregular intervals.)

13:100 Individual German arr.
Available only by arrangement with instructor.

13:101 Advanced Composition and Conversation 3 s.h.
Oral and written exercises; required of undergraduate German majors and minors. May be repeated for credit. Prerequisite: 13:33 and 13:34 or equivalent.

13:103 German Phonology 3 s.h.
Analysis of structure of sound system of German language and introduction to problems of German morphology and syntax; basic linguistics course. Same as 103:143.

13:104 The Third Reich and Literature 3 s.h.
Nazi literature, literature of the Holocaust and the Opposition, and exile literature; in translation. Same as 108:104.

13:105 German Cultural History 3 s.h.
Cultural history of Germany from earliest beginnings to present, with special emphasis on development of arts, philosophy and literature.

13:106 Principles and Techniques of Translation 3 s.h.
Introduction to theory of translation; study of and practice in methods and techniques of translating technical, scientific, journalistic, and literary texts; primary emphasis on German to English translation. Prerequisite: 2 years college-level German or equivalent.

13:107 Translation: Projects and Colloquium 2-4 s.h.
For students wishing to pursue individual translation projects on an advanced level in their own fields of interest; discussion of common problems and mutual evaluation of work by participants. Prerequisite: 13:106 or equivalent.

13:108 Yiddish Literature in Translation 3 s.h.
Representative works of Mendele, Peretz, Aleicham, I.B. Singer and other writers of Yiddish in the 19th and 20th centuries. Same as 108:108.

13:109 Regents Program Abroad in Austria arr.
See description above under Foreign Study.

13:111 Survey of German Literature 3 s.h.
Survey of development of German literature from earliest times to 1775. Prerequisite: 13:32 or equivalent.

13:112 Survey of German Literature 3 s.h.
Survey of German literature from 1775 to present. Prerequisite: 13:32 or equivalent.

13:120 Methods: Foreign Language 3 s.h.
Same as 7S:116, 9:150, 20:119, 35:130.

13:121 Methods of German Language Teaching 2 s.h.
Orientation and training in techniques of elementary and intermediate language teaching; readings on theoretical and practical topics serve as a basis for class discussion; scheduled observation of foreign-language teachers in the classroom.

13:123 Women in German Literature 3 s.h.
Readings in English translation from German literature; exploration of the position of women in society, of stereotyped sex roles, and of reactions to movements for the equality of women as evident in German literature from pre-Christian times to the present. Not for credit toward the German major. Same as 108:123.

13:137 20th Century German Fiction 3 s.h.
Study of major novels of the period from Musil to the present; readings in English by arrangement with instructor; discussion in English.

13:139 Contemporary German Literature 3 s.h.
Contemporary literature of East and West Germany, Austria, and Switzerland. For advanced undergraduate and graduate students.

13:154 Human Nature and the Impact of Science 2-4 s.h.
Interdisciplinary discussion course moderated by two instructors; studies the relationship of science to humanistic, social and religious thought. No knowledge of German is required. Same as 33:154.

13:173 Music as Drama 2-4 s.h.
Libretto and score as autonomous and interdependent elements in German opera. No prior expertise in music as literature required, but knowledge of one or the other helpful. Same as 33:173.

13:182 Lessing 3 s.h.
Concentration on his major dramas, which may be taken in English translation. Same as 36T:184.

13:183 The Faust Tradition in Western Civilization 3 s.h.
Development of Faust theme in world literature, beginning with antiquity, the historical Faust, the *Faustbook*, Marlowe's *Dr. Faustus*, critical analysis of Goethe's *Faust I*, last act of *Faust II*, and of modern Faust criticism. No knowlege of German required. Same as 108:183.

Language Courses for Graduation in Other Fields of Study

(Some of the courses listed below are offered at irregular intervals.)

13:113 Intensive Elementary German 4 s.h.
Graduates only. Description same as for 13:13.

13:125 Intensive Second Year German 4 s.h.
Graduates only. Description same as for 13:25.

13:151 Ph.D. Reading 0 s.h.
Service course for graduate students seeking research tool competence in German as required by their respective departments; 13:151 is intended for those students who have had no previous experience in German and for those who want a complete review of prior experience with the language.

13:152 Ph.D. Reading 0 s.h.
A continuation of 13:151, but oriented toward reading for comprehension. Prerequisite: 13:151 or equivalent, or consent of instructor.

Graduate Courses

13:200 Advanced Studies arr.
Special problems of German literature and linguistics; open to graduate majors in German.

13:201 German Proseminar 3 s.h.
General introduction to graduate study in areas of German literature and Germanic linguistics, stressing bibliography, methods of research, thesis preparation and writing, and other specific problems.

13:202 German Proseminar 3 s.h.
Continuation of 13:201.

13:220 The German Novel 3 s.h.
May be repeated for credit.

13:223 German Poetry 3 s.h.
May be repeated for credit.

13:224 The German Drama 3 s.h.
May be repeated for credit.

13:225 The German Drama of the Storm and Stress 3 s.h.

13:227 German Novelle 3 s.h.
Origin and history of novelle in Germany; critical analyses of representative works with emphasis on characteristics and artistic development of the genre.

13:241 History of the German Language 3 s.h.
Development of German language and dialects from prehistoric times to present. Same as 103:231.

13:243 Middle High German 3 s.h.
Grammar and syntax of High German literary language in period from 11th to 14th centuries; primarily for students concentrating in linguistics. Same as 103:252.

13:244 Middle High German Literature 3 s.h.
Primarily for students concentrating in literature.

13:245 Old High German 3 s.h.
High German dialects in their earliest recorded forms and cultural, political and social influences exerted upon them from within and without German-speaking area, 6th to 11th centuries; selected readings from literature of period. Same as 103:253.

13:247 Gothic 3 s.h.
Gothic of Ulfilas and its importance for understanding of historical development of Germanic languages; introduction to comparative Indo-European linguistics. Same as 103:255.

13:249 History of the Scandinavian Languages 3 s.h.
Development of Scandinavian languages from earliest times to present; extensive readings in linguistic texts in Danish, Swedish and Norwegian. Prerequisite: one old Germanic language. Same as 103:232.

13:251 Early German Literature 3 s.h.
German literature from earliest documents to Middle High German period.

13:261 German Literature of the Renaissance and Reformation 3 s.h.
Phenomenon of Renaissance and rise of its parallel movement in religion, the Reformation; development of these two movements in German literature and thought; readings and analyses of their representative works.

13:271 German Literature of the Baroque 3 s.h.
Baroque age in German literature and thought; study of its most representative works.

13:281 The Age of Enlightenment and the Early Period of Storm and Stress 3 s.h.

13:283 The Age of Goethe 3 s.h.
Storm and Stress (Goethe, Schiller, Klinger, Lenz, etc.) and the Weimar Classicism (1794-1805) of Goethe and Schiller; the interdependence of the movements and their theoretical basis (Herder, Winckelmann, etc.) will be treated in connection with representative works of the period.

13:285 Goethe 3 s.h.
His life and thought as expressed in major literary works.

13:286 Schiller 3 s.h.
Friedrich Schiller's life and literary, historical, and philosophical works; his position in his own time and posterity.

13:291 German Romanticism 3 s.h.
German Romanticism; its representative writers and influence of its philosophy on modern civilization.

13:294 German Realism 3 s.h.
Concept, development, and manifestations of Realism in German literature; extensive readings with critical analyses of representative works.

13:295 Naturalism, Impressionism, and Expressionism in German Literature 3 s.h.
Survey of German literary currents from Realism into 20th century.

13:298 Special Topics in German Literature arr.
May be repeated for credit.

13:300 Master's Thesis arr.

13:350 Pre-Comprehensive Registration 0 s.h.

13:371 Seminar in Early German Literature 3 s.h.
May be repeated for credit.

13:381 Seminar in German Literature of the 18th Century 3 s.h.
May be repeated for credit.

13:391 Seminar in German Literature of the 19th Century 3 s.h.
May be repeated for credit.

13:395 Seminar in German Literature of the 20th Century 3 s.h.
May be repeated for credit.

13:399 Theory of Literature 3 s.h.

13:400 Ph.D. Dissertation arr.

Greek

See "Classics."

History

Department chair: Charles A. Hale
Faculty: *professors* W.O. Aydelotte, Robert Dykstra, Lawrence Gelfand, Ralph Glasey, Jonathan Goldstein, Charles A. Hale, Ellis W. Hawley, John B. Henneman, Henry Horwitz, Sydney V. James, Linda K. Kerber, Laurence Lafore, Jaroslaw Pelenski, Stow Persons, Malcolm J. Rohrbough, David Schoenbaum, Alan B. Spitzer, Donald Sutherland
professors emeriti W. Ross Livingston, Sidney Mead
assistant professors R. David Arkush, T. Dwight Bozeman, Jeffrey L. Cox, Paul Greenough, Sarah H. Madden, Allan Megill, Hermann Rebel, Stephen Vlastos, Lynne Withey
instructor Jonathan Walton
Degrees offered: B.A., M.A., Ph.D.

The purpose of the Department of History is to enlarge knowledge of the human experience and to provide students with opportunities to gain information and learn methods for understanding their world in the light of its past. In addition to offering these essential elements of liberal education, the Department trains professional historians and teachers of history, serves those who require a knowledge of a period or aspect of history as background for their own specialized interests in other fields, and participates in several interdisciplinary programs such as American Civilization, Afro-American Studies, Asian Studies, and Women's Studies.

The Undergraduate Program

Baccalaureate graduates in history go into a variety of positions in business, public service, or journalism. Many plan further training in history, law, religion, library science, or social work.

A major in history includes work in other fields which will illuminate and expand the meaning of history courses as well as introduce the undergraduate to different bodies of information and approaches to understanding the ways societies and cultures work. It is, for example, strongly recommended that the College of Liberal Arts degree requirement in a foreign language be met by selecting a language which fits in with the major student's history interests.

General Major in History

The general major is for students with a general interest in history. The program requirements are:

A minimum of 24 semester hours in courses offered by the Department of History, of which at least 12 semester hours must be in non-U.S. This limitation is imposed to assure acquaintance with the history of at least one other society besides our own.

Three semester hours in 16:51 Colloquium for History Majors. A colloquium consists of a small number of students collectively studying problems in ways which give training and experience in group discussion, analysis and criticism. It is best taken after the student has finished a number of other history courses.

Of the 24 semester hours of history, nine (including the three hours of colloquium) must be taken in residence at The University of Iowa.

A minimum of 16 to 18 semester hours in related courses in anthropology, economics, fine arts (excluding studio courses), geography, literature (excluding workshop courses), philosophy, political science, psychology, religion, and sociology; or a second major in one of these areas. Core courses and courses taken to satisfy core requirements will not be counted toward the related-areas requirement.

It is recommended but not required that the student pursuing the general major meet the College of Liberal Arts historical-cultural core requirements with 11:29-30 Problems in Human History, 11:31-32 Western Civilization, or 11:55-56 Civilizations of Asia.

Prospective Teachers in History

Students majoring in history who wish to qualify for a teaching certificate must satisfy the historical-cultural core requirement by taking any two of the following courses: 11:29-30 Problems in Human History, 11:31-32 Western Civilization, 11:55-56 Civilizations of Asia (a total of 8 s.h.); and complete the professional courses in the College of Education which are required for teacher certification (a total of 23 s.h.).

They must choose an area of concentration in history and meet these requirements:

American History Concentration

Courses in U.S. history	20 s.h.
Courses in related areas	36-44 s.h.

Students must pick three of the following six related areas: economics, geography, world history (non-U.S.), political science, psychology, sociology. They must take 12 semester hours of courses in each of the three areas they choose, except psychology, in which they must take 20 semester hours. Courses in these subjects which have been taken to satisfy the social science core requirement may be applied to the required hours in related areas, but no more than one such course may be applied to any one related area.

World History Concentration

Courses in non-U.S. history	20 s.h.
Courses in related areas	36-44 s.h.

Students must pick three of the following six related areas: economics, geography, American history, political science, psychology, sociology. They must take 12 semester hours in each of the three areas they choose, except psychology, in which they must take 20 semester hours. Courses in these subjects which have been taken to satisfy the social science core requirement may be applied to the required hours in related areas, but no more than one such course may be applied to any one related area.

Students seeking the teaching major in history should consult an adviser in Social Studies Education (see "College of Education").

Honors

The Honors major is for students of superior ability who want an extremely flexible program enabling them to pursue special interests and enjoy the experience of individual research. To undertake the Honors major in history, the student must be admitted to the College of Liberal Arts Honors Program by the director of that program, and to the Honors Program in History, by the Department. Application usually must be made by the beginning of the junior year, and may be made earlier. Successful completion of the Honors major leads to the Bachelor of Arts degree with Honors in History. Requirements are:

A minimum of 24 semester hours of work in history, with at least nine hours in the Department's Honors offerings, which may include up to six semester hours of Honors thesis credit. Colloquium courses may also be counted for Honors credit in lieu of Honors seminars.

Related courses outside the Department (same as regular major requirement).

Successful completion and oral defense of an Honors thesis.

Graduate Study

The graduate programs in History prepare students to teach in high schools or colleges, and for such occupations as publishing, commercial research, and government or other public service. With additional specialized training, students of history become qualified for careers in archival work, library work, or historical site preparation and display. Some students enter the program leading to degrees in both law and history (see "College of Law").

Qualified graduate students are invited to apply for fellowships and assistantships. Inquiries should be directed to the departmental office.

The Master's Degree

There are two M.A. programs in the History Department. The first is for students who plan to work for the Ph.D. degree. It requires a minimum of 30 semester hours of credit, including the completion of a research essay. The candidate must earn at least 24 semester hours of credit in history. Twelve, including at least one seminar, must be in the area of the student's essay topic, and at least six must be in a second division, including either a seminar or a readings course.

The essay in the major division is based on original research and should be in the vicinity of 10,000 to 15,000 words in length. Work on the essay will normally begin in the seminar in the major division and be continued with 16:296 Individual Study: Graduate, in which rewriting will be completed under the guidance of the supervisor. In exceptional cases where the essay completed in seminar is judged to be of outstanding quality, other courses may be substituted for Individual Study.

Students who complete the M.A. under the alternative plan may not become candidates for the doctorate in history. The M.A. candidate must earn at least 24 semester hours of credit in history. Of these, at least 12 must be taken in one division, and must include at least one readings or seminar course. The program must also include at least six semester hours in each of two other divisions in history, or six hours in one other division in history and six hours in a related department. These hours must include at least one readings or seminar course in history.

After completing these requirements, or in the semester in which they are to be completed, the M.A. candidate must take an oral and written comprehensive examination in the major division.

Doctor of Philosophy

Students who earn the M.A. with research essay are admitted to the Ph.D. program upon the favorable recommendation of the examining committee. Students who earn an M.A. at another university must meet the general requirements for admission to the Graduate College (see "Graduate College") and must submit a specimen of their writing, such as a seminar paper or an M.A. thesis.

The candidate must earn at least 72 semester hours of credit, including credit for work done toward the master's degree. The 72 semester hours must include at least 24 semester hours in 200-level courses in history, apart from thesis credit. At least 16 of these 24 hours must be completed before taking the comprehensive examinations, and at least 16 of these 24 hours must be completed at The University of Iowa. The candidate must also earn two semester hours of credit in the philosophy of history, historiography, or methods of historical research.

The Department has no common language requirement for the Ph.D., but the supervisor may require the candidate to demonstrate a reading knowledge of one or more foreign languages and proficiency in the use of other tools of study. The candidate may not complete the comprehensive examination until these requirements have been met.

The comprehensive written and oral examination will cover four distinct fields, at least three of them in history. The fields in history must be chosen from at least two of these divisions:

The Ancient World
Medieval Europe
Europe, 1500 to 1815
Europe, 1815 to Present
Russia and the Soviet Union
United States History
Latin American History
History of China
History of Japan
History of India

The committee may define and delimit the individual fields for examination. It may also set, separately for each field, the character of the written portion of the comprehensive examination, which may take the form of a syllabus, a critical bibliography, a topical paper, or any other form or combination of these or other forms that the committee deems suitable. The oral portion of the comprehensive examination will focus on issues and problems arising from the examination papers.

Graduate Admission

All applicants for admission, whether for the M.A. or the Ph.D. program, must meet the general requirements for admission to the Graduate College. In addition, they must submit a specimen of their writing—such as a term paper, seminar paper, or M.A. thesis—to the History Department. All applications for graduate awards are due February 15 for the succeeding year. Applications for admission are due April 15 and November 10 for the following semesters. An applicant must take the Graduate Record Examination (aptitude tests) in order to be considered for admission. An undergraduate history major is not required for admission to the graduate program.

Guide to Graduate Study

Further information on graduate study is contained in the Department's *Guide to Graduate Study*, sent to all applicants for admission. The *Guide* is revised every spring to include the latest changes in the faculty, the courses to be offered the following year, and the research interests of the members of the faculty, as well as detailed regulations on study toward advanced degrees and other information of interest to prospective students.

Special Facilities

The University Library is strong in all aspects of U.S. history. It houses the Henry A. Wallace papers and related collections, as well as other unique materials. In European history, the special strengths are in French and English materials. The Iowa State Historical Society in Iowa City and the Herbert Hoover Presidential Library in West Branch possess additional research materials of great value.

Courses

All courses numbered below 200 are open to freshmen provided they have already satisfied the historical-cultural core requirement. Most courses numbered below 200 are offered in alternate semesters. Most courses numbered 200 and above are offered as occasion demands.

16:51 Colloquium for History Majors 3 s.h.
Topics vary with the instructor. Must be completed by all majors. Open to other than history majors by consent of instructor. Offered every semester. May be repeated.

16:60 Introduction to Afro-American Society 3 s.h.
General works in anthropology, sociology, and history provide framework for introduction to social and cultural history of Afro-Americans. Same as 45:60

16:61 American History 1492-1877 3 s.h.
Main themes from discovery through Civil War and Reconstruction, with emphasis on social history of Colonial Era and social, economic, and political developments of Revolutionary and antebellum periods.

16:62 American History 1877-Present 3 s.h.
Main themes since Civil War, with emphasis on social and political developments of the Gilded Age, Progressive Era, Great Depression, and United States as a world power.

16:72 Religion in American History 1607-1800 2-3 s.h.
Protestant, Catholic and Jew from Colonial Era to present. Same as 32:72.

16:89 Culture and Politics of Latin America 3 s.h.
Emphasis on elements of social and institutional continuity from colonial times to the present.

16:92 Individual Study Undergraduate arr.

16:94 Honors Tutorial arr.

16:99 Historical Background of Contemporary Issues arr.
Varying topics, depending on instructor.

16:100 Historical Background of Contemporary Issues arr.
Varying topics. May be repeated with the consent of the instructor.

16:101 Individual Study: Undergraduate arr.
Intended for students who wish to pursue subjects beyond or not available in existing courses. Prior arrangement with individual instructor is necessary. May be repeated.

16:102 Honors Tutorial arr.
Individual study for Honors majors. May be repeated.

16:103 Honors Thesis arr.
Supervised research and writing. May be repeated.

16:104 Honors Seminar arr.
Colloquium for Honors majors. May be repeated.

16:105 Topical Issues in Afro-American History 3 s.h.
Seminar on philosophical and political thought of various Afro-Americans during the 19th and 20th centuries. Same as 45:185.

16:106 Survey of Ancient Near East and Greece 3 s.h.
Social, economic, political, and intellectual history of ancient civilization from its rise in Mesopotamia to eve of conquests of Alexander the Great.

16:107 The Hellenistic World and Rome 3 s.h.
Social, economic, political, and intellectual history of the Graeco-Roman world from 4th century B.C. to Justinian's reign.

16:108 National and Religious Resistance to Ancient Empires 2 s.h.
Study of this phenomenon in Neo-Babylonian, Persian and Hellenistic empires, and in Italy under the Roman Republic.

16:110 Medieval Civilization 3 s.h.
Europe from the decline of the Roman empire to the Renaissance: cultural, political, and economic foundations of Western civilization.

16:111 Survey of Early Medieval Civilization 3 s.h.
Europe from decline of Roman Empire to High Middle Ages: cultural, political, and economic foundations of Western civilization.

16:112 Survey of Later Medieval Civilization 3 s.h.
Europe from High Middle Ages to Renaissance, with emphasis on medieval thought and institutions. Continuation of 16:111; may be taken independently.

16:113 Economic and Social History of Medieval Europe 3 s.h.
Survey of economic, demographic, and technological changes, 300-1500, stressing their impact on such groups as peasants, knights, women, students, merchants, artisans.

16:114 Foundations of English Law 3 s.h.
From the origins of the common law to early modern times: landlords and tenants, husbands and wives, justice as profession and ideal, and more.

16:115 Medieval England ca. 450-1216 2-3 s.h.
Anglo-Saxon civilization, the Norman conquest, and the rebuilding of the nation from the conquest to Magna Carta. Third hour's credit earned by writing term paper.

16:116 Medieval England 1216-1485 2-3 s.h.
Primary emphasis upon constitutional history and the growth of the English idea of freedom. Third hour's credit earned by writing term paper.

16:117 History of the Medieval Church 2-3 s.h.
300-1300 A.D., the church in its centuries as the commonwealth of Europe: growth of the commonwealth, its inner conflicts, beginnings of its decay. Third hour's credit earned by writing term paper.

16:118 Early France and the Age of Chivalry 3 s.h.
Social and political history of Medieval France from the coming of the Franks through the Hundred Years' War (450-1500).

16:119 French Middle Ages in Literature 2-3 s.h.
Discussion-type course, based on historical novels and chronicles in translation, dealing with French society from the 12th to 16th century. Prerequisite: one previous course in medieval history or French civilization.

16:120 Tradition and Technology 1500-Present 2-3 s.h.
Conceptual and historical problems of technological development; emphasis on the philosophical, aesthetic and linguistic background to technological change and on related social change. Third hour's credit earned by writing term paper.

16:121 Society and Culture in Europe 1500-1648 3 s.h.
Beginnings of the modern age: changes in world view, in sense of national identity, in social relationships, and in consciousness of self.

16:123 Age of the Renaissance 3 s.h.
The origin and growth of Renaissance culture in Italy from the 14th to the 16th century and its transmission to other western European nations.

16:124 Reformation and Counter-Reform 1500-1700 3 s.h.
European political, social, and economic developments and their impact on religion: emphasis on how individuals in this era adjusted their inner lives to changes in everyday life.

16:125 Dynasties, States, and Corporations 3 s.h.
Discusses such dynasties as the Hapsburgs, Hohenzollerns, Tudors and Stuarts, Bourbons, Bonapartes, and others; theories and practices of the state and of corporations, 1520-1815.

16:126 European Intellectual History 1500-1700 3 s.h.
Intellectual concepts underlying basic aspects of European life, 1500-1600, stressing changes in cosmology, humanism, philosophy, art and politics.

16:128 France from Renaissance to Revolution 3 s.h.
Era of French preponderance of power and predominance in European culture: political, social, and cultural history of old regime.

16:129 French Revolution and Napoleon 3 s.h.
Antecedents of the Revolution, principal developments in France, impact of the Revolution on Europe.

16:130 Early Modern England 1529-1783 3 s.h.
England from the Reformation to the Industrial Revolution.

16:131 England: Reformation to the Civil War 1509-1649 3 s.h.
Political and religious consequences of the English Reformation and of the economic developments of the 16th and early 17th centuries.

16:132 England: Civil War to the American Revolution 1649-1776 3 s.h.
England's development from the execution of King Charles I to the American Revolution.

16:133 Germany 1500-1848 3 s.h.
Emergence and development of a distinctive modern German culture in Central Europe: religion, philosophy, science, politics, economic and social development. A consideration of women's roles in European life since 1500.

16:134 Nineteenth-Century Europe 3 s.h.
Main factors in European history: political, economic, social, and intellectual.

16:135 20th-Century Europe 1900 to World War II 3 s.h.

16:136 Europe During World War II and After 3 s.h.

16:137 Historic Restoration Methodology 3 s.h.
Same as 17:157.

16:138 France From 1815 to the Present 3 s.h.
Continuation of 16:129, may be taken independently.

16:139 Modern Britain 1760-1867 2-3 s.h.
Survey of British history from the industrial revolution to the mid-Victorian age. Third hour's credit earned by writing a term paper.

16:140 Modern Britain 1867-Present 2-3 s.h.
Survey of British history from the age of Gladstone and Disraeli to the present. Third hour's credit earned by writing a term paper.

16:141 Germany 1789-1914 Consummation of Power 3 s.h.
Central Europe in an era of literary, philosophical and musical genius of national unification and radical social change.

16:142 Germany Since 1914: Society and Revolution 3 s.h.
Germany in an age of cultural disorientation and political flux; reconstitution of the nation since 1945.

16:143 First World War 3 s.h.
Social, economic, political and technological as well as military aspects of causes, conduct, and consequences of the war of 1914-1918. Readings in fiction and contemporary documents as well as historical works. Three short papers and a final examination. 4th hour's credit with completion of written assignment on feature films to be shown in 16:145 when offered concurrently.

16:144 European Aristocracies 1450-1850 2-3 s.h.
The fate of the several aristocracies after the Malthusian Renaissance; the significance of aristocratic culture in European history. Third hour's credit earned by writing a term paper.

16:145 World War I in Film 3 s.h.
Viewing and discussion of feature and documentary films on First World War, with reading and written assignments; emphasis on films as documentary source for understanding events and contemporary moral and social issues. Not open to students enrolled in 16:143. Fourth hour's credit in 16:143 obtained, however, by doing written assignment on the feature films shown in 16:145.

16:146 Modern European Social Thought: Adam Smith to Marx 3 s.h.
Origins and early development of social theory. Smith, Paine, Burke, Fourier, Mill, Proudhon, and other thinkers.

16:147 Marxism and Social Thought 3 s.h.
Analysis of the origins and development of Marx's social and political theory, with some attention also to non-Marxist thinkers.

16:148 The Enlightenment 1689-1789 3 s.h.
Montesquieu, Diderot, Voltaire, Rousseau, and other thinkers of the 18th century.

16:149 War and Society 3 s.h.
The military profession, strategic thought, the conduct of war and the civil-military relationship during the past 200 years.

16:150 European Socialist and Labor Movements 3 s.h.

16:151 History of East Central Europe to 1800 3 s.h.
Problems in political, socioeconomic, and cultural history of the Polish-Lithuanian Commonwealth, Kingdom of Hungary, and Bohemia (Czechs).

16:152 History of East Central Europe 1800-Present 3 s.h.
Special emphasis on period of independent statehood (1918-1945) and new Communist systems in the history of the Poles and non-Germanic peoples of the Hapsburg Empire.

16:153 Origins of Contemporary Thought 2-3 s.h.
From Zarathustra to "post-structuralism." Nietzsche, Freud, Marx, Darwin, Husserl, Sartre, Heidigger, Foucault, Derrida and sundry others.

16:154 Kievan Russia and Muscovite Russia to 1682 3 s.h.
Major political, socioeconomic, cultural, and ideological developments in Kievan and Muscovite periods.

16:155 Imperial Russia 1682-1917 3 s.h.
Major political, socioeconomic, and ideological developments in Imperial Russia.

16:156 Soviet Union 1917-Present 3 s.h.
History of the Revolution; political, socioeconomic and ideological developments in Soviet period.

16:158 Society and the Sexes in Traditional Europe 2-3 s.h.
Social history of Europe, 1200-1800, from the standpoint of the experience of women in diverse historical paradigms.

16:159 Society and the Sexes in Modern Europe 2-3 s.h.
Social history of Europe, 1750-1950, from the standpoint of the experience of women in diverse historical paradigms.

16:160 History of Colonial Africa 3 s.h.
From the partition by European powers in the late 19th century to independence in the 1960s. Same as 45:164.

16:161 The Colonial Period in America 3 s.h.
Foundation and growth of English colonies in North America; colonial and imperial political history before 1715; economic and cultural history, 1607-1750.

16:162 American Revolution Period 1740-1789 3 s.h.
Political and military history of the colonies 1715-76; imperial upheaval; creation of federal system.

16:163 United States in the Early Republic 3 s.h.
The early republic from Washington to Jackson, emphasizing industrialism, plantation economy, abolition, family patterns and women's rights.

16:164 Civil War and Reconstruction 3 s.h.
The military crisis, end of slavery, legal and social change.

16:165 The Gilded Age in America 3 s.h.
The emergence of industrial and urban America, from the Civil War through the 1890s. Emphasis on social and political developments.

16:166 The Progressive Era in America 3 s.h.
The years of protest and reform, imperialism, and World War I, from the 1890s to 1920.

16:167 The Contemporary United States 1920-1940 3 s.h.
U.S. in the interwar period, with emphasis on the New Era system, the impact of the Great Depression, and the responses of the Hoover administration and the New Deal.

16:168 The Contemporary United States 1940-Present 3 s.h.
U.S. as a global power, with emphasis on World War II and the Cold War, recent patterns of social and economic change, and the politics of the 1950s and 1960s.

16:169 The Revolutionary Generation in America 3 s.h.
How the American Revolution did (and did not) promote change, as observed through the experiences of several families.

16:170 Modern African History 3 s.h.
Selected topics in the history of Africa in the 20th century. Topics vary. May be repeated. Same as 45:170.

16:171 The Frontier in American History to 1840 3 s.h.
Settlement of the eastern half of the American continent, to 1840; significance of land in American development; the conflict between European and Indian civilizations.

16:172 Frontier in American History 1840-1900 3 s.h.
Settlement and economic development of the trans-Mississippi West covered in topical sequence.

16:173 Families and Communities in U.S. History 3 s.h.
Introduction to American social history, concentrating on changes in the family and community in the pre-Civil War period.

16:174 American Economic History 3 s.h.
Same as 6E:151.

16:175 American Puritanism 2-3 s.h.
Historical survey emphasizing such themes as redemption, the state, the family, women, Indians, sex. Same as 32:177.

16:176 Varieties of American Religion 2-3 s.h.
Survey of distinctive religious groups: Shakers, Mormons, Christian Scientists, Jehovah's Witnesses, Black Muslims, Pentecostals, etc. Same as 32:174.

16:177 United States in World Affairs to 1900 3 s.h.
Origins of modern diplomatic practices, including problems of security, territorial and commercial expansion, legal and constitutional problems.

16:178 United States in World Affairs 1900-1975 3 s.h.
Emergence of America as a leader in world affairs, including problems of imperialism, international collaboration, participation in two global wars and the cold war.

16:179 American Thought and Civilization 1620-1865 3 s.h.

16:180 American Thought and Civilization 1865-Present 3 s.h.

16:181 Studies in Women in America 1600-1870 3 s.h.
Survey, with particular attention to the role of gender in shaping social experience; changes in work, educational opportunity and domestic relationships.

16:182 Studies in Women in America after 1870 3 s.h.
From the passage of the 14th Amendment to the present, emphasizing the suffrage movement, economic roles, and educational patterns. Students have the option of writing a history of women in their own families.

16:183 History of Iowa to 1900 3 s.h.
History of Iowa within context of American development.

16:184 History of Iowa since 1900 3 s.h.
Political, economic, and social changes with special reference to two world wars, prosperity, depression, and the growing influence of national life.

16:185 Afro-American History 1600-1865 3 s.h.
Topics include the slave trade, blacks in Colonial America, slaves and free blacks, and blacks during the Civil War. Same as 45:165.

16:186 Afro-American History 1865 to Present 3 s.h.
Topics include Reconstruction, Jim Crowism, World Wars I and II, and the civil rights protests of the 1950s and 1960s. Same as 45:166.

16:187 The City in American History 3 s.h.
Political, social, and physical development of cities,

especially since the Civil War. Topics include immigration, changes in political organization and styles, architecture and city planning.

16:188 U.S. in a World at War 1931-1945 3-4 s.h.
By integrating documentary films with lectures and assigned readings, this course considers the significance of the Second World War for the U.S. Five hours of class time, including films.

16:189 Religious Thought in America 1607-1860 2-3 s.h.
The religious factor in the "life and mind in America," with reference to selected leaders of American thought during this era. Same as 32:175.

16:190 Religious Thought in America 1860 to Present 2-3 s.h.
Continuation of 16:189. May be taken independently. Same as 32:176.

16:191 Contemporary Asia News Colloquium 2-3 s.h.
Readings and discussion of contemporary Asian affairs as reported in the Asian and U.S. press, emphasizing political and economic themes. Third hour's credit earned by writing a term paper. Intended normally to be taken Pass-Fail or S-U. Same as 39:150.

16:192 The Mexican Revolution 3 s.h.
Emphasis on Mexico's social upheaval of 1910-40 and its relation to 19th-century and contemporary patterns.

16:193 History of Ancient and Traditional India 3 s.h.
Social, economic, and cultural survey of India from Harappan period through early Islamic period, ca. 2500 B.C.-1500 A.D. Same as 39:133.

16:194 Imperialism and Modern India 3 s.h.
Indian history since 1500 A.D., emphasizing Mughal and British imperial systems, nationalist movements, and current socioeconomic trends. Same as 39:134.

16:195 Traditional China 3 s.h.
Development of Chinese civilization in premodern times, emphasizing ideas, social life, and government institutions. Same as 39:153.

16:196 Modern China 3 s.h.
Impact of the West, decline of old China, the Chinese revolution, reconstruction of Chinese society since 1949. Same as 39:154.

16:197 Premodern Japan 3 s.h.
Japanese development through the Tokugawa period; emphasis on the development of Japanese feudalism; relations with China and the West. Same as 39J:153.

16:198 Modern Japan 3 s.h.
Transformation of feudal Japan into a world power. Emphasis on internal modernization and Japanese imperialism. Same as 39J:154.

16:199 Colloquium in Modern Asia arr.
Reading and discussion course, with varying topics. May be repeated.

16:200 Statistical Methods in History arr.
Introduction to quantitative approaches to historical analysis.

16:201 Seminar: Quantitative History arr.

16:211 Seminar: Late Medieval Continental Europe arr.

16:212 Readings: Medieval History arr.

16:213 Seminar: Medieval Society and Institutions arr.

16:215 Seminar: Roman Law 1200-1600 arr.

16:219 Readings: Early Modern Europe arr.

16:221 Seminar: Early Modern Europe arr.

16:224 Augustan Studies: History and Literature 3 s.h.
Same as 8:244.

16:225 Seminar: Early Modern England 1450-1750 arr.

16:226 Readings: Early Modern England 1450-1750 arr.

16:227 Readings: Comparative Europe 1500-1700 arr.

16:230 Readings: Early Modern European Social History arr.

16:231 Readings: Modern European Social History arr.

16:235 Seminar: Modern Europe arr.

16:236 Readings: Modern European History arr.

16:239 Seminar: Modern Britain arr.

16:240 Readings: Modern Britain arr.

16:245 Seminar: Modern European Intellectual History 3 s.h.

16:246 Readings: Modern European Intellectual History arr.

16:251 Seminar: Central or Eastern Europe 15th-18th Centuries arr.

16:252 Readings: Central or Eastern Europe 15th-18th Centuries arr.

16:254 Legislative Behavior 4 s.h.

16:255 Seminar: Russian (or Soviet) History arr.

16:256 Readings: Russian (or Soviet) History arr.

16:258 Readings: Women in European History arr.

16:260 Seminar: Modern Social History arr.

16:261 Seminar: American Colonial History arr.

16:262 Readings: American Colonial History arr.

16:263 Seminar: The American Middle Period arr.

16:264 Readings: The American Middle Period arr.

16:265 Seminar: American Social History arr.

16:266 Readings: The Gilded Age and Progressivism arr.

16:267 Seminar: Contemporary United States arr.

16:268 Readings: The Contemporary United States arr.

16:271 Seminar: American Frontier arr.

16:272 Readings: The American Frontier arr.

16:273 Readings in American Social History arr.

16:275 Seminar: American Religious Thought arr.
Same as 32:275.

16:276 Seminar: American Puritanism arr.
Same as 32:276.

16:277 Seminar: American Foreign Relations arr.

16:278 Readings: American Foreign Relations arr.

16:279 Seminar: American Intellectual History arr.

16:280 Readings: American Intellectual History arr.

16:284 Seminar: History of American Women arr.

16:285 Seminar: Afro-American History arr.
Same as 45:285.

16:286 Readings: Afro-American History arr.
Same as 45:286.

16:287 Readings: History of American Women arr.

16:288 Readings: Latin American History arr.

16:289 Seminar: Latin America arr.

16:291 Seminar: Modern Chinese History arr.
Same as 39:254.

16:292 Topics in Modern Chinese History arr.
Same as 39:258.

16:294 Readings: Japanese History arr.
Same as 39J:257.

16:295 Readings in the History of India arr.
Same as 39:295.

16:296 Individual Study: Graduate arr.

16:297 Thesis arr.

16:298 Philosophy of History 2 s.h.

16:299 Historiography 2 s.h.

Home Economics

Department chair: Sara C. Wolfson
Faculty: *professors* Margaret N. Keyes, Floy Eugenia Whitehead
professors emeritae Adeline M. Hoffman, Margaret O. Osborn, Sybil Woodruff
associate professors Elizabeth Alden, Naomi Schedl, Sara C. Wolfson
associate professor emerita Lulu E. Smith
assistant professors Iva M. Bader, Ei Soon Cho, Carol C. Fethke, Carolyn W. Lara-Braud, Mabel H. Parsons
assistant professor emerita Harriet A. Stevens
instructors Marjorie Caruth, Rochelle Conway, William J. Doherty, Lorraine T. Dorfman, Dorothy L. Fowles, Sara J. Kadolph, Helen L. Savage
lecturers Marion Leiserson, Rosalie Seeks
Degrees offered: B.A., B.S., M.A., M.S., M.A.T.

The mission of the Department of Home Economics is to enhance the quality of life, with a program designed to develop a working understanding of the individual within his/her environment.

Through education, the Department prepares professional home economists to work with individuals and families, or with businesses, agencies, and organizations providing goods, services, and programs which enhance the quality of life. It also contributes to the liberal and professional education of nonmajors.

Through research, the Department creates new knowledge for and about individuals and families.

Through community service and other activities, the Department directly assists individuals and families with their needs and problems.

The Department fulfills this mission by means of a liberal education that has a strong theoretical base and that also uses applied approaches. Through study, understanding and use of design and housing, family development, food and nutrition,

home economics education, and textiles and clothing, home economics contributes to the physical, psychological, social, and aesthetic development of people.

Home economics as a career offers a wide range of opportunities: teaching, dietetics, merchandising, interior and textile design, product development and quality control in textile and food industries, consumer relations, family life education and services, food service management, and service with community or government agencies.

Undergraduate Requirements

The undergraduate program prepares students for immediate employment as professional home economists, and also for advanced study.

Concentration in design and housing, family development, food and nutrition, home economics education, or textiles and clothing makes it possible for undergraduate majors to develop specialization. The home economics core provides a central body of knowledge and a basic understanding of relationships among the various areas of specialization within home economics. Joint programs may be arranged with other fields such as journalism, art, social work and education.

In meeting the general requirements for the B.A. or B.S. degree of the College of Liberal Arts, students majoring in home economics need to select courses in other departments which also are prerequisites for home economics courses.

All students majoring in home economics complete this core:

17:9 Human Development and the Family	3 s.h.
17:41 Food, Nutrition and Man	3 s.h.
17:50 Design for the Home	3 s.h.
17:80 Textiles for Consumers	3 s.h.
17:111 Management of Family Resources	3 s.h.
17:190 Seminar: Home Economics	2 s.h.

The Bachelor of Arts

Design and Housing

Students concentrating in design and housing are prepared for careers in residential and contract interior design, space planning, design consulting, merchandising, fabric design and weaving. The requirements for this concentration:

17:52 Presentation Graphics	3 s.h.
17:54 Interior Design: Principles and Practices I	3 s.h.
17:155 Survey of Historic Interiors	4 s.h.
17:160 Textile Design: Printing and Dyeing	3 s.h.
17:165 Housing: Planning and Structural Aspects	3 s.h.
11:37 Form and Theory in the Visual Arts	4 s.h.
or	
11:38 Art in the Western World	4 s.h.
1B:1 Elements of Art	2-3 s.h.
or	
1B:2 Elements of Art	2-3 s.h.
or	
An approved two-dimensional studio art course	
1A:4 Basic Design	2 s.h.
or	
An approved three-dimensional studio art course	

Two of the following, one of which must be a studio course:

17:153 Interior Design: Principles and Practices II	3 s.h.
17:154 Interior Design: Principles and Practices III	3 s.h.
17:156 Survey of Modern Interiors	2 s.h.
17:157 Historic Restoration Methodology	3 s.h.
17:162 Textile Design: Basic Weaving	3 s.h.
17:163 Textile Design: Intermediate Weaving	3 s.h.
17:164 Textile Design: Forms and Fibers	3 s.h.
17:166 Housing: Social and Psychological Aspects	3 s.h.

One of the following:

6B:31 Introduction to Marketing	3 s.h.
6E:1 Principles of Economcs	4 s.h.
or	
6E:2 Principles of Economics	4 s.h.

Electives from home economics, business administration, urban and regional planning, art history, studio art, social sciences, and computer science are recommended.

Family Development

This program prepares students for careers with agencies and services concerned with the total family and its functioning, for family life education, and for the extension service. Required:

17:10 Growth and Development of the Young Child	3 s.h.
17:113 Marriage and Family Interaction	3 s.h.
17:114 Parent-Child Relationships	3 s.h.
17:115 Parent-Child Relationships in the Exceptional Family	3 s.h.
17:119 Directed Studies in Family Development	arr.
17:122 Materials and Methods in Family Life Education	3 s.h.
31:1 Elementary Psychology	4 s.h.
34:1 Introduction to Sociology: Principles	4 s.h.

One of the following:

34:159 The Family in Various Societies	3 s.h.
34:161 The American Family	3 s.h.
34:162 Courtship, Marriage and Alternative Life Styles	3 s.h.

Electives from home economics, education, social work, psychology, and sociology are recommended.

Food and Nutrition

This program prepares students for careers in dietetics, in the food industry, and for service with community and government agencies. A concentration in food and nutrition requires:

17:131 Food Study	2 s.h.
17:132 Food Study Laboratory	2 s.h.
17:133 Meal Management	2 s.h.
17:134 Experimental Food I	3 s.h.
17:135 Experimental Food II	3 s.h.
or	
17:146 Nutrition Laboratory	2 s.h.
17:142 Nutrition	3 s.h.
4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Elementary Chemistry Laboratory I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
4:141 Intermediate Chemistry Laboratory I	2 s.h.
61:157 General Microbiology	4 s.h.
72:13 Introduction to Human Physiology	4 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.
99:130 Metabolism	3 s.h.

Electives should be selected from home economics and the natural sciences.

A concentration in nutrition with emphasis on dietetics requires:

17:131 Food Study	2 s.h.
17:132 Food Study Laboratory	2 s.h.

17:133 Meal Management	2 s.h.
17:134 Experimental Food I	3 s.h.
17:136-137 Institution Management I-II	6 s.h.
17:142 Nutrition	3 s.h.
17:146 Nutrition Laboratory	2 s.h.
17:147 Diet Therapy	3 s.h.
4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Elementary Chemistry Laboratory I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.
99:130 Metabolism	3 s.h.
6E:1 Principles of Economics	4 s.h.
6B:158 Personnel Management	3 s.h.
7P:75 Educational Psychology and Measurement	3 s.h.
or	
7P:131 Educational Psychology	3-4 s.h.
34:1 Introduction to Sociology: Principles	4 s.h.
or	
31:1 Elementary Psychology	4 s.h.
61:157 General Microbiology	4 s.h.
72:13 Introduction to Human Physiology	4 s.h.
113:3 Introduction to the Study of Culture and Society	4 s.h.

Electives should be selected according to the student's professional objective from the natural sciences, business administration, psychology, computer science, statistics, education and home economics.

This program follows minimum academic requirements of the American Dietetic Association Plan IV. All students applying for internships and traineeships must have programs centrally screened the first semester of the senior year.

Home Economics Education

This program leads to certification and vocational approval in home economics. Graduates are qualified to teach home economics in vocational and nonvocational secondary schools, to work in home economics extension and other agencies, and to teach in nonschool settings. Required:

17:31 Introductory Food Study	2 s.h.
or	
17:131-132 Food Study, Food Study Laboratory	4 s.h.
17:112 Personal Financial Management	3 s.h.
17:113 Marriage and Family Interaction	3 s.h.
or	
17:114 Parent-Child Relationships	3 s.h.
17:121 Curriculum: Home Economics	3 s.h.
17:128 Evaluation: Home Economics	2 s.h.
17:133 Meal Management	2 s.h.
17:165 Housing: Planning and Structural Aspects	3 s.h.
or	
17:166 Housing: Social and Psychological Aspects	3 s.h.
17:72 Apparel, Fashion and Selection	3 s.h.
or	
17:170 Custom and Contemporary Tailoring	3 s.h.
or	
17:171 Fitting Problems and Flat Pattern Design	3 s.h.
1B:1 Elements of Art	2-3 s.h.
or	
1B:2 Elements of Art	2-3 s.h.
6E:1 Principles of Economics	4 s.h.
or	
6E:2 Principles of Economics	4 s.h.
31:1 Elementary Psychology	4 s.h.
34:1 Introduction to Sociology: Principles	4 s.h.

In addition, students must complete the coursework generally required for teacher certification. The methodology course required in home economics education is 7S:125 Methods: Home Economics (3 s.h.).

In addition to the general requirements to be eligible for student teaching (7S:191 or 7S:192), the student in home economics education must have completed 28 semester hours of home economics courses with a 2.5 grade-point average in that work, and must have received no grade less than "C" in the home economics courses required for home economics endorsement and vocational approval.

For the general requirements to be eligible for student teaching and for certification, see "College of Education" and "Secondary Education."

Students beginning their programs in 1978 and afterwards will be required to have 400 hours of paid employment in a home economics-related occupation (e.g., food service, day care center, retailing) for certification. This work experience can be through 17:000 Cooperative Education Training Assignment or through verification of work experience. Electives should be selected from education, journalism, psychology, sociology and communication.

Textiles and Clothing

This program prepares students for careers in merchandising.

Concentration in fashion merchandising requires:

17:70 Introductory Clothing Construction	3 s.h.
17:72 Apparel Fashion and Selection	3 s.h.
17:81 Science of Textiles	3 s.h.
17:170 Custom and Contemporary Tailoring	3 s.h.
17:171 Fitting Problems and Flat Pattern Design	3 s.h.
17:173 Fashion Merchandising	3 s.h.
17:181 Textile Finishing, Dyeing, and Detergency	3 s.h.
17:183 Textile and Apparel Economics	3 s.h.
4:7-8 General Chemistry I-II	6 s.h.
and	
4:9 General Chemistry Laboratory	2 s.h.
or	
4:13-14 Principles of Chemistry I-II	6 s.h.
and	
4:16 Elementary Chemistry Laboratory I	2 s.h.
6E:1 Principles of Economics	4 s.h.
6B:31 Introduction to Marketing	3 s.h.
6B:61 Administrative Management	3 s.h.
6B:135 Consumer Behavior	3 s.h.
6B:137 Advertising Theory and Planning	3 s.h.
11:37 Form and Theory in the Visual Arts	4 s.h.
A course in computer science	
A course in communications	

Courses in business administration, computer science, journalism, communication, and home economics are recommended as electives.

Concentration in textiles technology requires:

17:70 Introductory Clothing Construction	3 s.h.
17:72 Apparel, Fashion and Selection	3 s.h.
17:81 Science of Textiles	3 s.h.

17:181 Textile Finishing Dyeing and Detergency	3 s.h.
17:182 Textile Analysis	3 s.h.
17:183 Textile and Apparel Economics	3 s.h.
4:7-8 General Chemistry I-II	6 s.h.
and	
4:9 General Chemistry Laboratory	2 s.h.
or	
4:13-14 Principles of Chemistry I-II	6 s.h.
and	
4:16 Elementary Chemistry Laboratory I	2 s.h.
6E:1 Principles of Economics	4 s.h.
11:37 Form and Theory in the Visual Arts	4 s.h.
22M:2 Mathematical Techniques I	3 s.h.
22S:102 Introduction to Statistical Methods	3 s.h.

Electives from computer science, statistics, engineering, psychology, chemistry, economics, and home economics are recommended.

The Bachelor of Science

The B.S. programs are recommended for students who want greater depth or breadth in the natural sciences, and for those interested in research positions in colleges and universities or in industrial, governmental or medical research laboratories.

Food and Nutrition

In addition to the requirements for the B.A. degree emphasizing food or nutrition, the B.S. degree requires the following courses:

22M:2-3 Mathematical Techniques I-II	6 s.h.
22M:20 Elementary Functions	3 s.h.
22M:25 Calculus I	4 s.h.
29:11-12 College Physics	8 s.h.
4:130 Physical Chemistry for the Life Sciences	3 s.h.
or	
99:140 Experimental Biochemistry	4 s.h.

Home Economics Education

Graduates can enter the careers described for the B.A. degree. The B.S. program enables students to obtain greater depth and breadth in the natural and social sciences. In addition to the courses and work experience listed for the B.A. degree, the B.S. requires:

4:7-8 General Chemistry I-II	6 s.h.
4:9 General Chemistry Laboratory	2 s.h.
A course in statistics	3 s.h.
Two courses from the natural sciences and/or courses numbered 100 or above in anthropology, economics, psychology or sociology	6-8 s.h.

Textile Science

This program prepares students for positions in the textile industry, and for graduate studies. In addition to courses listed for the B.A. degree in textile technology, these are required for the B.S. degree:

4:101 Elementary Quantitative Analysis	4 s.h.
4:121-122 Organic Chemistry I-II	6 s.h.
22M:25 Calculus I	4 s.h.
22M:26 Calculus II	4 s.h.
or	
22M:3 Mathematical Techniques II	3 s.h.
and	
22M:20 Elementary Functions	3 s.h.
22M:29 Computation Laboratory for Calculus and Linear Algebra	arr.
29:11-12 College Physics	8 s.h.
or	
29:17-18 Introductory Physics I-II	8 s.h.

Electives should be selected from chemistry, engineering, computer science, statistics, microbiology, and home economics.

Cooperative Education/Internship Program

The Department participates in the University's Cooperative Education Program, which enables students to obtain work experience related to their professional goals and academic program. Majors who are concentrating in design and housing, home economics education, or textiles and clothing, and who meet the Department's requirements, may apply to the Department's Cooperative Education Committee for participation in this program.

The Honors Program

To be eligible for Honors, the student must have junior standing, 30 semester hours in residence at the University, an overall cumulative grade-point average of 3.0 or above, a grade-point average of 3.2 in all home economics courses, and at least 12 semester hours completed in home economics. Honors work consists of 17:191 Honors Seminar: Home Economics and 17:192 Honors Problems: Home Economics in which students do creative work or a research project. A written report or Honors Thesis and an oral examination are required.

The Graduate Program

The demand for well-qualified professional home economists far exceeds the number of graduates with advanced degrees. The master's degree graduate may qualify for positions in colleges, secondary schools, business, industry, and government.

The graduate program enables students to obtain depth through specialization in one of five subject areas: design and housing, family development, food and nutrition, home economics education, and textiles and clothing.

The Department offers both thesis and nonthesis programs. The thesis plan is recommended for students preparing for teaching and research in colleges and universities, for positions in industry, and for continued study beyond the master's degree. The thesis program permits more intensive experience in research procedures or the opportunity for extensive creative work. The thesis may be undertaken in the Department, or in cooperation with related departments or colleges.

To be admitted unconditionally, the student must have an overall grade-point average of 2.8 with 3.0 in the area which is to be the major interest in graduate study.

Master's Programs

For either the Master of Arts or Master of Science degree, students must complete a minimum of 30 semester hours of graduate work with a thesis, or 38 semester hours of graduate work without a thesis, in addition to adequate prerequisites for courses selected. Approximately one-third of the student's coursework is completed in departments other than Home Economics. The designation of the degree, M.A. or M.S., depends on the area of major work.

All students in the M.A. and M.S. programs are required to complete 17:290 Seminar: Home Economics Research. Those in the thesis program complete 17:291 Thesis.

Design and Housing

Graduate study in design and housing may be planned as a specialized program in interior design or textile design, or as a more general program including a wider variety of courses. Applicants to this program must present a portfolio prior to admission. A variety of career opportunities is available to the M.A. graduate in design and housing. These include college teaching, interior design, textile design, historic preservation and restoration, and positions in business and industry. Required (depending on previous coursework):

17:156 Survey of Modern Interiors	2 s.h.
17:250 Seminar: Design and Housing	2 s.h.
17:269 Research: Problems in Design and Housing	2-4 s.h.
17:290 Seminar: Home Economics Research	2 s.h.
One course in art history	3 s.h.
One course in studio art	3 s.h.

Courses for interior design specialization:

17:153 Interior Design: Principles and Practices II	3 s.h.
17:154 Interior Design: Principles and Practices III	3 s.h.
17:155 Survey of Historic Interiors	4 s.h.
One course in textile design	3 s.h.
One course in housing	3 s.h.

Courses for textile design specialization:

17:160 Textile Design: Printing and Dyeing	3 s.h.
17:162 Textile Design: Basic Weaving	3 s.h.
17:164 Textile Design: Forms and Fibers	3 s.h.
17:260 Studio Workshop in Fiber	4 s.h.
One other course in textile design	3 s.h.

Family Development

The graduate student gains both psychological and sociological perspectives in understanding the family. Graduates work with agencies concerned with the family or prepare for college and university teaching. Required:

17:118 Sexuality and the Family	3 s.h.
17:212 Seminar: Family Dynamics	arr.
17:213 Theory in Family Development	3 s.h.
17:219 Research Problems in Family Studies	arr.
17:290 Seminar: Home Economics Research	2 s.h.
7P:106 Child Development	3 s.h.
A course in statistics	3 s.h.

Food and Nutrition

Graduate work may emphasize foods, nutrition, or nutrition education. Graduates qualify for positions in educational institutions, business, industry, government, and the health field. Applicants need background courses in foods, nutrition, general and organic chemistry, mathematics, physiology, and microbiology.

Required for specialization in food (M.S.):

17:134-135 Experimental Food I-II	6 s.h.
17:238 Seminar: Food	2 s.h.
17:239 Research: Problems in Food and Nutrition	2-4 s.h.
17:241 Seminar: Nutrition	2 s.h.
17:290 Seminar: Home Economics Research	2 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.
99:130 Metabolism	3 s.h.
61:157 General Microbiology	4 s.h.

Required for specialization in nutrition (M.S.):

17:134 Experimental Food I	3 s.h.
17:145 Advanced Nutrition	3 s.h.
17:146 Nutrition Laboratory	2 s.h.
17:238 Seminar: Food	2 s.h.
17:239 Research: Problems in Food and Nutrition	2-4 s.h.
17:241 Seminar: Nutrition	2 s.h.
17:290 Seminar: Home Economics Research	2 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.
99:130 Metabolism	3 s.h.
22S:101 Biostatistics	3 s.h.
or	
7P:143 Introduction to Statistical Methods	3 s.h.

Courses for Nutrition Education Specialization (M.A.):

17:124 Nutrition Work with Children or substitute, depending on professional goal	3 s.h.
17:145 Advanced Nutrition	3 s.h.
17:146 Nutrition Laboratory	2 s.h.
17:239 Research: Problems in Food and Nutrition	2-4 s.h.
17:241 Seminar: Nutrition	2 s.h.
17:290 Seminar: Home Economics Research	2 s.h.
7P:131 Educational Psychology	3 s.h.
7P:143 Introduction to Statistical Methods	3 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.

Home Economics Education

The graduate student's program in home economics education may be planned for depth in one specialization of home economics or for breadth in the whole of home economics. Graduates are prepared for positions in educational institutions at all levels, home economics extension service, social agencies, and business.

Applicants must have completed requirements for a teacher's certificate.

The program requirements:

17:223 Seminar: Readings in Home Economics Education	2 s.h.
17:229 Research Problems: Home Economics Education	arr.
17:290 Seminar: Home Economics Research	2 s.h.
7P:143 Introduction to Statistical Methods	3 s.h.

Textiles and Clothing

This program prepares students for careers in merchandising, textile research, teaching, extension service and communication. Required:

17:279 Research: Problems in Clothing	arr.
or	
17:289 Research: Problems in Textiles	arr.
17:290 Seminar: Home Economics Research	2 s.h.
7P:143 Introduction to Statistical Methods	3 s.h.

Additional courses in textiles and clothing are required based upon the student's educational background and professional needs.

Master of Arts in Teaching

The M.A.T. program is designed for students with an undergraduate degree in home economics who have had few or no professional education courses. The program is nonthesis and requires written and oral comprehensive examinations.

Graduates obtain a home economics teacher's certificate with vocational approval.

Applicants must have a bachelor's degree in home economics and a 2.7 minimum grade-point average, and must be admitted to the M.A.T. program in the College of Education.

The program requires 20 semester hours of graduate coursework in education and at least 18 semester hours of graduate work in home economics. For certification, the student must have completed (at the undergraduate and/or graduate level) a course in American politics or American government and two courses in each of the following areas: design and housing, family development, food and nutrition, family economics and home management, and textiles and clothing. Required are:

17:121 Curriculum: Home Economics	3 s.h.
17:128 Evaluation: Home Economics	2 s.h.
7P:131 Educational Psychology	3 s.h.
7S:125 Methods: Home Economics	3 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	12 s.h.
A course in the philosophy or history of education	2 s.h.

Certification-Only Program

Students with the B.A. or B.S. degree in home economics may enroll in the certification program in order to meet requirements for teaching vocational home economics in secondary schools. Courses for this program are selected according to the student's background and professional goals. See "College of Education."

Financial Awards

Several awards recognize students for their outstanding qualities and performance. The Omicron Nu Writing Award is given to recognize excellent written work completed in home economics courses. The Sophomore Book Award recognizes the sophomore home economics major with the highest grade-point average. The Margaret Foster Hoff Award is a full-tuition scholarship given to a student for her/his senior year. The Myrna Lee Sprengeler Memorial Award is given to an outstanding home economics senior.

Two awards are for graduate students. The Mary Campbell Tow Scholarship is given to a student beginning graduate study. The other scholarship is provided by the Iowa Home Economics Association. A limited number of assistantships are available to graduate students.

Courses

Primarily for Undergraduates

17:000 Cooperative Education Training Assignment 0 s.h.

17:9 Human Development and the Family 3 s.h.
Introduction to life-span human development; special emphasis placed on role of the family.

17:10 Growth and Development of the Young Child 3 s.h.
Growth and development of young children; emphasis on forces underlying growth and change.

17:31 Introductory Food Study 2 s.h.
Use of food science principles in the preparation of standard food products; includes laboratory. Prerequisite or corequisite: 17:41.

17:41 Food, Nutrition and Man 3 s.h.
Sociopsychological and environmental aspects of nutrition; basic principles of nutrition; basic principles in preparation of food products; composition of foods.

17:50 Design for the Home 3 s.h.
Introduction to housing; application of design principles to selection and arrangement of residential interiors and furnishings; lecture and studio problems. No art background needed.

17:52 Presentation Graphics 3 s.h.
Studio course to develop visual communication skills for interior design including sketching, rendering, perspective systems, color theory, and application. Prerequisite: 17:50 or consent of instructor.

17:54 Interior Design: Principles and Practices I 3 s.h.
Design of interior residential spaces, applying social, psychological, physical, economic, and esthetic factors. Prerequisites: 1B:1 or 1B:2, 17:50, 17:52, 17:80, or consent of instructor.

17:70 Introductory Clothing Construction 3 s.h.
Basic clothing construction competencies—use and selection of sewing equipment, patterns, and appropriate fabric; understanding of construction sequence and terminology. Proficiency test for exemption available.

17:72 Apparel, Fashion, and Selection 3 s.h.
Influence of culture and environment on clothing; design principles and elements applied to fashion; special clothing needs; and clothing selection problems.

17:80 Textiles for Consumers 3 s.h.
Textile fibers; production and properties; yarn structure; fabric constructions and finishes; legislation and regulation; current consumer issues.

17:81 Science of Textiles 3 s.h.
Chemical and physical properties of fibers; advanced fabric construction; effects and interactions of finishes; end uses of textile products. Prerequisites: 17:80, 4:7 or 4:13.

For Undergraduates and Graduates

17:108 Basic Aspects of Aging 2-3 s.h.
The study of the aging process of older adults and implications for the design of their near environment.

17:110 Sensitivity to Children 3 s.h.
Principles of healthy growth and development of normal children from birth to 8 years; observations of and interaction with young children.

17:111 Management of Family Resources 3 s.h.
Goals, planning, implementation, and control; how values affect goals, family-environment interaction; methods of decision making, resource allocation; management of time, energy, people, resources; special problems of the elderly, families with young children, low-income families. Prerequisite: 6E:1 or 6E:2 or consent of instructor.

17:112 Personal Financial Management 3 s.h.
Principles of family financial planning. Prerequisite: 6E:1 or consent of instructor.

17:113 Marriage and Family Interaction 3 s.h.
Contemporary American marriage and family relationships, including study of mate selection, marriage, and family interaction. Prerequisite: 31:1 or 34:1, or consent of instructor.

17:114 Parent-Child Relationships 3 s.h.
Synthesis and application of research in child rearing and parent-child relations.

17:115 Parent-Child Relationships in the Exceptional Family 3 s.h.
Synthesis and application of research related to parent-child relations in exceptional family situations.

17:116 Parent-Child-Teacher Relationships 3 s.h.
Dynamics of the interaction which may occur between the child, parents and teachers.

17:117 Human Sexuality 1-3 s.h.
Exploration of physiological and psychological aspects of human sexuality. Will not meet home economics core requirements. Same as 98:112, 42:112, 7C:112.

17:118 Sexuality and the Family 3 s.h.
Study of sexuality as it applies to various family developmental stages. Prerequisite: 17:117 or consent of instructor.

17:119 Directed Studies in Family Development arr.
Individual problems for advanced undergraduates and graduates. Prerequisite: consent of instructor.

17:120 Methods: Home Economics 3 s.h.
Philosophy, materials, and methods in home economics. Required for home economics endorsement and vocational approval. Same as 7S:125.

17:121 Curriculum: Home Economics 3 s.h.
Principles of curriculum planning; factors influencing home economics curricula for various programs. Required for home economics endorsement and vocational approval.

17:122 Materials and Methods in Family Life Education 3 s.h.
Philosophy, resources, and methods of presenting family life education materials in elementary, middle, junior high, high school, and adult education. Same as 7S:126.

17:124 Nutrition Work with Children 3 s.h.
Child nutrition; approaches and techniques currently used in nutrition education of children. Prerequisite: 17:41 or consent of instructor. Same as 7E:102.

17:125 Current Consumer Topics 1-3 s.h.
Current issues, developments and laws; application to individuals and families. May be repeated for credit. Same as 6S:193.

17:127 Organization and Administration of Cooperative Programs 3 s.h.
Objectives, operation, and coordination of cooperative office, distributive education, and other cooperative programs. Same as 6S:195.

17:128 Evaluation: Home Economics 2 s.h.
Measurement and evaluation principles; application in home economics. Required for home economics endorsement and vocational approval.

17:129 Directed Studies in Home Economics Education arr.
Individual problems for advanced undergraduates and graduates. Prerequisite: consent of instructor.

17:131 Food Study 2 s.h.
Food components and their use in preparation of foods. Prerequisite: 4:121. Corequisite: 17:132 or consent of instructor.

17:132 Food Study Laboratory 2 s.h.
Laboratory work in food preparation to accompany 17:131. Prerequisite: 4:121. Corequisite: 17:131.

17:133 Meal Management 2 s.h.
Factors affecting the management of food and its selection for meeting the physiological and psychological needs of individuals, families or groups within resources available; includes laboratory. Prerequisites: 17:31 or 17:131 and 17:132, and 17:41 or 17:142.

17:134 Experimental Food I 3 s.h.
Experimental study of factors affecting properties of foods. Prerequisites: 17:131 and 17:132. Corequisite: 4:122 or 99:120.

17:135 Experimental Food II 3 s.h.
Continuation of 17:134, which is a prerequisite.

17:136 Institution Management I 3 s.h.
Quantity food production and service; equipment selection, maintenance, and layout; observation and practice in food service units and residence halls. Prerequisite: 17:133 or consent of instructor.

17:137 Institution Management II 3 s.h.
Quantity food purchasing; organization and management of food service units; observation in hospitals. Prerequisite: 17:133 or consent of instructor.

17:139 Directed Studies in Food and Nutrition arr.
Prerequisites: junior, senior or graduate standing and consent of instructor.

17:142 Nutrition 3 s.h.
Principles of human nutrition. Prerequisites: 17:41 and 72:13; corequisite: 99:120.

17:145 Advanced Nutrition 3 s.h.
Continuation of principles of human nutrition. Prerequisite: 17:142, 99:120 or consent of instructor.

17:146 Nutrition Laboratory 2 s.h.
Introduction to nutrition research. Prerequisite: 17:142.

17:147 Diet Therapy 3 s.h.
Therapeutic use of diet in metabolic disturbances and in certain diseases. Prerequisite: 17:142 or consent of instructor.

17:152 Current Topics in Design and Housing arr.
Advanced undergraduates and graduates. May be repeated for credit. Summer sessions only. Prerequisite: consent of instructor.

17:153 Interior Design: Principles and Practices II 3 s.h.
Design problems and processes for contract interior spaces, including program development, space analysis, lighting, and other professional procedures and practices. Prerequisite: 17:54.

17:154 Interior Design: Principles and Practices III 3 s.h.
Design problems for residential and contract interiors; business procedures and practices for interior design profession. Prerequisites: 17:54 and 17:155.

17:155 Survey of Historic Interiors 4 s.h.
Development of home furnishings from Egyptian period to 1830; correlation with architecture and culture of the period.

17:156 Survey of Modern Interiors 2 s.h.
Development of modern home furnishings from 1830 to present; correlation with architecture and culture of 19th and 20th centuries.

17:157 Historic Restoration Methodology 3 s.h.
History of architecture and Iowa development 1800-1860, and of Old Capitol; orientation to work in museum and historic sites. Prerequisite: junior standing. Same as 16:137.

17:159 Directed Studies in Interior Design arr.
Advanced study of interior design. Prerequisites: senior or graduate standing, consent of instructor.

17:160 Textile Design: Printing and Dyeing 1-3 s.h.
Introductory problems in fabric design, block-printing, silk-screening, batik, tie dye, and fiber forms. Prerequisite: 1B:1 or 1B:2, a two-dimensional studio art course, or consent of instructor. Same as 1P:191.

17:162 Textile Design: Basic Weaving 3 s.h.
Design and execution of handwoven fabrics through experimentation with colors, fibers, and basic weaves. Prerequisite: 17:60, two basic studio art courses, or consent of instructor. Same as 1P:192.

17:163 Textile Design: Intermediate Weaving 3 s.h.
Exploration of sett, weave designing and drafting, double, tubular and supplementary weaves. Prerequisite: 17:162 or consent of instructor.

17:164 Textile Design: Forms and Fibers 1-4 s.h.
Two- and three-dimensional design problems using fabric complexes and off-the-loom techniques. Prerequisite: 17:160 or 17:162, or consent of instructor. Same as 1P:193.

17:165 Housing: Planning and Structural Aspects 2-3 s.h.
Study of designs, procedures, and standards currently used in construction of single- and multi-family housing structures.

17:166 Housing: Social and Psychological Aspects 3 s.h.
Interrelationships among the physical environment, culture, and family needs, and how social issues, public policy, and psychological needs are related to demand, supply, and design of housing. Prerequisite: social science core.

17:168 Directed Studies in Housing arr.
Advanced study in housing. Prerequisites: senior or graduate standing, and consent of instructor.

17:169 Directed Studies in Textile Design arr.
Advanced study in textile design. Prerequisite: senior or graduate standing, and consent of instructor.

17:170 Custom and Contemporary Tailoring 3 s.h.
Materials, designs, and construction techniques used in tailoring garments by custom and contemporary methods; evaluation of quality, workmanship, design, and fabrics in tailored ready-to-wear. Prerequisite: 17:70 or proficiency test.

17:171 Fitting Problems and Flat Pattern Design 3 s.h.
Application of principles of pattern design and drafting based on basic patterns and block measurements; analysis and solution of fitting problems. Prerequisite: 17:70 or proficiency test.

17:173 Fashion Merchandising 3 s.h.
History and analysis of the fashion industry; responsibilities of retail buyer in merchandising apparel and managing personnel. Prerequisites: 6E:1 or 6E:2 and 6B:31.

17:179 Directed Studies in Clothing arr.
Prerequisites: senior or graduate standing and consent of instructor.

17:181 Textile Finishing, Dyeing, and Detergency 3 s.h.
Dyes, finishes, detergents: their classification, methods of application and effect on serviceability of textiles. Prerequisites: 17:81, 4:8 or 4:14, and 4:9 or 4:16.

17:182 Textile Analysis 3 s.h.
Introduction to federal and industrial test methods and standards; qualitative analysis and use of textile testing equipment. Prerequisite: 17:181.

17:183 Textile and Apparel Economics 3 s.h.
Economic and industrial history of textiles; current developments and problems in production and marketing; government involvement. Prerequisites: 6E:1 or 6E:2.

17:184 Textile Quality Control 3 s.h.
Quality control systems; analysis of data to identify source of product variability; design of performance tests. Prerequisites: 17:182 and 7P:143 or consent of instructor.

17:189 Directed Studies in Textiles arr.
Prerequisites: senior or graduate standing and consent of instructor.

17:190 Seminar: Home Economics 2 s.h.
Scope of home economics: its origin, development, philosophy, present status and future direction; factors influencing curricula, research, and entire field; emphasis on home economics as an integrated field. Prerequisites: 17:9, 17:41, 17:50, 17:80, 17:111.

17:191 Honors Seminar: Home Economics 2-4 s.h.
Review of literature in area of interest; open to both majors and nonmajors.

17:192 Honors Problems: Home Economics 2-4 s.h.
Research project or creative work; open to both majors and nonmajors. Prerequisite: 17:191.

17:195 Home Economics Internship 0-4 s.h.
Relevant work experience complementing student's courses; written reports and seminar participation required semester following experience; may be full- or part-time, with credit based on objectives and employment situation. May be repeated for a maximum of 8 s.h. Prerequisite: approval by departmental cooperative education committee.

Primarily for Graduates

17:212 Seminar: Family Dynamics arr.
Reading and discussion of current literature in family interaction.

17:213 Theory in Family Development arr.
Relationship of developmental research and theory to family interaction; common processes within families over the life span. Prerequisite: 34:161 or consent of instructor.

17:214 Group Care Services for Children: the Need for Standards and Licensing 3 s.h.
Interdisciplinary seminar to examine historical, legal, and protective considerations in standards for out-of-home care, including health, safety, nutrition, developmental, and educational needs of children. Same as 7E:214, 42:214, 96:214.

17:215 Interdisciplinary Approaches to Serving Vulnerable Children and Their Families 3-4 s.h.
Interdisciplinary seminar focusing on identification of at-risk

groups in the population and on prevention, assessment and management of selected situational and developmental crises predicted to interfere with children's development. Prerequisite: consent of one instructor. Same as 42:215, 7E:215, 98:215.

17:219 Research: Problems in Family Studies arr.
Individual research problems of advanced students. Prerequisite or corequisite: 17:290.

17:221 Seminar: Home Economics in Higher Education 2-3 s.h.
History and philosophy of home economics; national and international organizations; analysis of home economics curricula in degree-granting institutions. Prerequisites: graduate standing and consent of instructor.

17:222 Workshop in Home Economics Education 1-3 s.h.
Recent developments in home economics education with discussion of the theories and research on which they are based. Summer sessions only.

17:223 Seminar: Readings in Home Economics Education arr.
Critical review of current literature in home economics education. Prerequisite: consent of instructor.

17:225 Consumer Issues Seminar 2-3 s.h.
Selected consumer topics from a wide variety of fields including consumer choice, rights and responsibilities, laws and regulations, the consumer and the marketplace, marketing methods, and consumer education. May be repeated with consent of instructor. Prerequisite: a course in statistics.

17:229 Research: Problems in Home Economics Education arr.
Individual research problems of advanced students. Prerequisite or corequisite: 17:290.

17:238 Seminar: Food arr.
Readings, reports, and discussion of current literature in food science. May be repeated for credit.

17:239 Research: Problems in Food and Nutrition arr.
Individual research problems of advanced students. Prerequisite or corequisite: 17:290.

17:241 Seminar: Nutrition 2 s.h.
Critical review of current periodical literature in nutrition. Prerequisite: 17:146 or consent of instructor.

17:250 Seminar: Design and Housing 2 s.h.
History and philosophy of interior design, textile design, and housing; readings, reports, and discussion of current literature. Prerequisite or corequisite: 17:290.

17:260 Studio Workshop in Fiber 4 s.h.
Fiber projects in a specific medium; emphasis on aesthetic direction; related readings. Prerequisites: 17:160, 17:162, 17:164 and consent of instructor.

17:269 Research: Problems in Design and Housing arr.
Individual research problems for advanced students. Prerequisite or corequisite: 17:290.

17:273 Clothing for the Physically Handicapped and the Aged 2-3 s.h.
Problems in satisfying clothing needs; solutions to some problems; review of research; work of selected agencies; analysis of specially-designed clothing. Summer sessions only.

17:278 Readings: Clothing arr.
Readings, reports, and discussion of current literature in clothing.

17:279 Research: Problems in Clothing arr.
Individual research problems for advanced students. Prerequisite or corequisite: 17:290.

17:282 Instrumental Analysis of Textile Materials 4 s.h.
Comparative analysis of fibers and fabric properties and the study of methods for scientific evaluations of these properties.

17:288 Readings: Textiles arr.
Readings, reports, and discussion of current literature in textiles.

17:289 Research: Problems in Textiles arr.
Individual research problems for advanced students. Prerequisite or corequisite: 17:290.

17:290 Seminar: Home Economics Research arr.
Methods and techniques of research in home economics and closely allied fields. Prerequisite or corequisite: a course in statistics or consent of instructor.

17:291 Thesis arr.
Master's degree candidates.

17:293 Workshop on Aging: Social Gerontology for Home Economists 2-3 s.h.
Characteristics, attitudes, and behavior of older people; physical, social, economic, and psychological problems and needs; current legislation and community resources. Summer sessions only.

Hospital and Health Administration

See "College of Medicine."

Italian

See "French and Italian."

Journalism

School director: Kenneth Starck
Faculty: *professors* James Carey, Hanno Hardt, Kenneth Starck, Albert Talbott
professor emeritus Leslie G. Moeller
associate professor Joseph Ascroft
assistant professors Kay Amert, Lary Belman, James Bow, Nancy Harper, Karin Ohm, James Wollert, Thomas Zynda
instructors John Butler, Richard Johns, Dean Kruckeberg, Richard Lentz
lecturers Clarence Andrews, Patricia Westfall
Degrees offered: B.A., B.S., M.A., Ph.D. (in mass communications)

Undergraduate Programs

Our main objective in the undegraduate program is to prepare students for professional work in mass communication. Our emphasis is on print media, but there are many opportunities for students in other areas of mass communication as well.

Since journalists must know not only how to communicate but what to communicate, our faculty believes students should have a liberal arts background in addition to their professional preparation. Thus, we require students to take about three-fourths of their coursework outside the School. Students also must develop a second major—that is, in addition to their journalism major—or the equivalent of a second major. This helps students develop a subject area of professional competence.

At Iowa we offer undergraduate students a choice of two sequences—News-Editorial (accredited by the American Council on Education for Journalism) or Mass Communication. Both require certain courses, but they also permit much freedom in course selection. To begin with, students in both sequences must fulfill these basic School requirements:

19:101 Cultural and Historical Foundations of Communication	3 s.h.
19:103 Social Scientific Foundations of Communication	3 s.h.
19:110 Introduction to Journalistic Writing	2 s.h.
19:130 Ethical and Legal Issues in Communication	3 s.h.
Total	11 s.h.

Both the Bachelor of Arts and the Bachelor of Science degrees require at least 30 semester hours of coursework in journalism.

To satisfy the second-major requirement, the B.A. student may either complete a standard program in another discipline, or complete an approved concentration of 25-30 hours of related courses in several departments.

Additional requirements for the B.S. degree are either 26:104 Introduction to Philosophy of Science or 26:103 Introduction to Logic, and one of the following:

- A full B.S. major in a natural or social science;
- A 24-semester-hour concentration in the natural or social sciences, beyond university core requirements; or
- 12 semester hours in courses emphasizing natural or social science methods.

Course selections for either of the latter two options must be approved in advance.

Except as already noted, the B.A. and B.S. requirements are the same. General requirements for both are outlined in the College of Liberal Arts section of the *Catalog*.

Before beginning the final 45 semester hours of baccalaureate work in journalism, each

student must design a plan of study and present it for adviser approval.

News-Editorial Sequence

This sequence is concerned with the gathering, organizing, and effective writing of news and other information from printed, human and environmental sources, and with the processing, packaging and display of news stories, articles and illustrations, for printed and broadcast media. This sequence also provides for the development of the various technical skills required for work in the student's choice of media. Journalism coursework required for this emphasis:

19:112 News Reporting and Writing	4 s.h.
19:114 News Processing	3 s.h.
19:116 Advanced Reporting	2 s.h.

Maximum journalism credit allowed toward graduation: 36 s.h.

Mass Communication Sequence

This is an alternative to the News-Editorial Sequence, offering several other approaches to obtaining a major in the School of Journalism.

One approach is laboratory oriented. Stressing applied theory and practice, this track affords students a variety of opportunities to develop and refine their skills in such media as writing, graphic design and typography, still and motion picture photography, and audio and video production. Career possibilities include broadcasting, video, public relations and organizational communication as well as others.

Another approach in this sequence is primarily theoretical. It emphasizes the acquisition of knowledge about communication in lecture and seminar settings in which the basic perspective is humanistic and theoretical. This track concentrates on the study of communication as a way of apprehending society and human interaction with the focus on historical, philosophical and social scientific modes of understanding. Students in this track often pursue graduate studies in other or related areas.

It is possible to combine both approaches into one program.

Special requirements for the two tracks of the Mass Communication Sequence are:

Laboratory Track

19:181 Mass Communication Lab and at least 15 semester hours of other applied journalism courses in such areas as writing, public relations, video, typography, photography, etc. Program must be approved in advance by adviser.

Theoretical Track

19:182 Special Topics in Communication and at least 17 semester hours of other journalistic courses, including nine in advanced journalism conceptual courses.

Maximum journalism credits allowed toward graduation: 36 s.h.

Graduate Programs

Master of Arts

The Master of Arts degree program in journalism combines professional practice in the media with consideration of the effects, responsibilities and significance of the media. It prepares students for a wide variety of positions in communication, and for study at the doctoral level.

The degree is offered with or without thesis, with either a professional journalism or a communication and mass communication emphasis, both requiring a minimum of 30 semester hours of graduate-level coursework.

Professional Journalism Emphasis

This program is designed for individuals who want to improve their technical skills and broaden their understanding of the role and function of the profession in contemporary society, but who do not plan to go on to doctoral study.

For students with no professional experience and an undergraduate degree in a field other than journalism, the M.A. in professional journalism requires:

19:112 News Reporting and Writing (does not count toward the required 30 s.h.)	4 s.h.
19:200 Master's Seminar (Section 1 to be taken during the first semester)	3 s.h.
19:240 News Communication I: Principles and Practice	4 s.h.
19:241 News Communication II	3 s.h.
19:251 Master's Research (final semester; culminates in Master's Project)	3 s.h.

Plus electives for a minimum total of 30 semester hours, including courses in other departments, with the consent of the student's adviser. The final examination is taken during the last enrollment period.

For students with professional experience in communication and journalism, the M.A. in professional journalism requires:

19:200 Master's Seminar (Section 1 to be taken during the first semester)	3 s.h.
19:251 Master's Research (final semester; culminates in Master's Project)	3 s.h.

Plus electives for a minimum total of 30 semester hours, at least 15 of which must be taken in the School of Journalism.

Doctorate in Mass Communication

The doctoral program in mass communication is an interdisciplinary program whose central objective is to develop scholars who will make significant contributions to teaching and research in communication. The background it provides is applicable in a number of fields, including university teaching, news communication, international communication and various others requiring ability to develop effective communication strategies. The program is designed around a small core of graduate work in communication, and encourages the student to work with his or her sponsor and committee in the development of an appropriate, individualized plan of study.

Iowa Center for Communication Study

The Center encourages and facilitates inquiry into communication problems by faculty members and by graduate and undergraduate students, via diverse approaches—philosophical, systems design, historical, legal, behavioral, literary. Center services include consultation, training, publication in appropriate outlets, assistance in obtaining financial support for projects and assistance in computer use and data analysis. The Center publishes the semiannual *Journal of Communication Inquiry*, which is student-edited and seeks to explore different approaches to communication theory and research.

Other Special Facilities

In the Communications Center the School has specialized laboratories for photography, typography, audiotaping, videotaping, typing, copy preparation and print production. Many students use the newsroom of the University student newspaper, *The Daily Iowan*, as a professional laboratory. The School also has its own Resource Center and Gallery.

Courses

19:35 Introduction to Broadcasting and Film Production 3 s.h.
For student with no previous experience; project-oriented, with short video production, two short Super-8 films and two audio productions required; emphasis on formulative principles and effectiveness of communication. Equipment and training provided. Open to freshmen. Same as 36B:35.

19:81 Introduction to Communication Skills 1-4 s.h.
Series of short courses stressing development of a variety of applied communication skills; e.g.; video, audio, graphics, photography, advertising, group decision-making, research methods, etc. May be repeated to maximum of 6 s.h. Open to freshmen.

19:88 Newswriting and Editing for Community Audience 3 s.h.
First you learn what news is, how to define your audience, where news comes from and how to get it. Finally, you learn how to write the story and how to prepare it for publication or broadcast. Offered through Division of Extension and University Services only.

19:91 Media and Consumers 1-2 s.h.
Examines communications media historically and in terms of political and economic contexts, and their relationships with audiences; develops criteria for evaluating media content within a consideration of the nature and consequences of news, entertainment and advertising. Nonmajors only.

19:101 Cultural and Historical Foundations of Communication 3 s.h.
Historical perspective on communication in its cultural, legal, philosophical and ethical context. Open to nonmajors and freshmen. Same as 122:100.

19:103 Social Scientific Foundations of Communication 3 s.h.
Deals with social scientific research and theory as they pertain to understanding of processes of interpersonal and mass communication; consideration is given to models, effects and functions of communication, as well as basis in signs, symbols and language. Open to nonmajors and freshmen. Same as 122:103.

19:110 Introduction to Journalistic Writing 2 s.h.
Overview of role and preparation of news, news reports and news media with lab practice in several journalistic writing formats. Open to nonmajors. Prerequisite: Soph. standing.

19:112 News Reporting and Writing 4 s.h.
Reporting techniques and experiences in identifying news and information sources, contacting these sources and "liberating" news and information from them; emphasis is on clear and informed thinking that leads to the writing of news stories and articles that are intelligible, comprehensive and interesting to the consumer; a variety of writing styles is employed, although the stress is on print publications; legal implications of news reporting also covered; assignments include coverage of university departments and activities, municipal and county governments, schools and courts. Prerequisite: 19:110.

19:114 News Processing 3 s.h.
Basic techniques of copy editing and headline writing and their legal ramifications; preparation of edited material for publication, including makeup design for printed media, particularly newspapers with some comparative understanding of other media; familiarization with technology of publishing and its effect on editing, and understanding of the new electronic systems that are being developed for the printed media. Prerequisite: 19:112.

19:116 Advanced Reporting 2-3 s.h.
Final course in journalism laboratory sequence. Depth reporting projects of publishable quality with topics ranging from government and courts to business and economics. Stress on advanced reporting and writing methods and strategies. Prerequisites: 19:112 or consent of instructor.

19:130 Ethical and Legal Issues in Communication 3 s.h.
Introduction to the various substantive legal and ethical issues affecting the media. Areas include, but are not limited to, free press-fair trial, libel, privacy, privilege, obscenity, access and other First Amendment issue areas. Open to non-majors.

19:133 Advertising Problems 3 s.h.
Advertising as a social and economic institution and a persuasive form of mass communication.

19:135 Radio-Television News 3 s.h.
Focus on all phases of broadcast news from laboratory practice in gathering and editing to contemporary trends and issues in broadcast journalism; laboratory experience involves tapes and film; all work done against absolute deadlines. Prerequisite: 19:110 or the equivalent.

19:136 Radio-Television News Workshop arr.
Advanced students develop competence in broadcast journalism practice; laboratory experience includes tapes, film, radio and television newscasts, news documentary production; all work done against absolute deadlines. May be repeated to maximum of 6 s.h. Prerequisite: 19:135.

19:138 Technological and Economic Issues in Media 3 s.h.
Traces the development of the technologies and economic beliefs and machinery that undergird the various communication systems of modern societies, and explores the major problems and opportunities involved in their further development, particularly with respect to the globalizing of communication systems.

19:139 Methods Journalism 3 s.h.

19:140 Methods: Secondary School Journalism 3 s.h.
Improving journalism activities in secondary schools with focus on methods of teaching; problems involved in advising student publications and attention to the production process of producing school publications. Same as 7S:113.

19:141 Approaches to News Reporting 1-4 s.h.
Deals with fundamentals of news reporting. Designed for students in the Bachelor of Liberal Studies program. Instructor's permission required.

19:142 Workshop for Secondary School Journalism/Communication Teachers 2-3 s.h.
Includes instruction in journalism/mass media curriculum, video-audio production, photojournalism, publication design, journalistic writing techniques, and advising student publications. Other workshops added as teacher training needs change. Same as 7S:130.

19:144 Popular Culture and Mass Communication 3 s.h.
An examination of (1) the nature of popular culture as the distinct culture of Western industrial society, and (2) the intellectual approaches to popular culture in the general categories of conservative, liberal, and radical.

19:146 Current Magazine Practice 3 s.h.
Role of magazines in America today; organization of magazine staffs and publishing organizations; analysis of editorial and advertising contents; identifying audiences.

19:147 Free-Lance Workshop 3 s.h.
Emphasis will be on submitting finished magazine articles, short stories and screenplays to editors, publishers and studios for publication and production; student can choose which area to work in and get individual help. Student must submit material from one of these areas before admission. Same as 8W:159.

19:148 Free-Lance Writing 3 s.h.
Free lance writing is defined as nonfictional or factual writing; newspaper feature stories and editorials, magazine articles and essays, profiles and biographies, historical pieces and, depending on you, books. Offered through Division of Extension and University Services only. Same as 8W:158.

19:149 Introduction to Photography 1 s.h.
Six-week introduction to operating 35 mm. camera, developing black and white film, and making prints.

19:150 Photocommunication I 3 s.h.
General introduction to communicating with photographs; covers techniques of black and white photography, editing photographs, combining words and photographs for variety of purposes; group critiques of weekly assignments emphasize integrating aesthetics, technique and concern for purpose. Corequisite: 19:149.

19:151 Photocommunication II 3 s.h.
Continuation of Photocommunication I, with greater emphasis on individual work. In-class group critiques. Prerequisite: 19:150 or consent of instructor.

19:152 Visual Communication 3 s.h.
Visual media as products of relationships among individual perception and experience, culture and technological change; emphasis on historical development of still and moving picture imagery as documentary expressions. Prerequisite: sophomore standing.

19:155 Communication and Public Relations 3-4 s.h.
Analysis of public relations problems within organizational systems; emphasis on communication theory and research in development of conceptual and operational perspectives in dealing with internal and external organizational publics.

19:156 Public Relations Practice 2-3 s.h.
Development of writing skills and styles suitable for relaying public relations information to the various news media; additional emphasis on outlets utilized in placing such information before the public.

19:160 Comparative Communication Systems 3 s.h.
Introduction to democratic, communist and fascist principles and practices of mass communication; survey of contemporary communication systems in selected countries.

19:165 Introduction to Typography 3 s.h.
Characteristics, qualities and history of typographic letterforms; design, production, differentiation and use; critical standards in typographic design; laboratory work.

19:166 Graphic Design and Production 2-3 s.h.
Design and production of publications; understanding and critical awareness of contemporary practices; design-oriented assignments.

19:174 Communication Research Methods 3 s.h.
Fundamentals of scientific inquiry in the study of communication and communication systems, with emphasis on learning the language, concepts, procedures and application of research methods, including survey, content analysis and experimental.

19:175 Communication Systems Design 3 s.h.
Design and evaluation of actual communication systems to achieve ends, e.g., instructional or educational games and

simulations; emphasis on live, open systems; consideration of games and simulations for both educational and theory building.

19:176 History of Mass Communication in the United States 3 s.h.
Studies the development of the major systems of public communication in American history, with particular emphasis on the growth and significance of American mass media systems. Prerequisite: coursework in American history and consent of instructor.

19:179 Internships arr.
Designed for students who have arranged internships with newspapers, broadcast media and magazines and in public relations. Signed consent of instructor required at registration.

19:180 Special Projects in Mass Communication arr.
Research and extended readings to fit special needs and interests of student. May be repeated. Prerequisite: signed consent of instructor must be obtained before registration.

19:181 Mass Communication Lab 4 s.h.
Students work in production teams which conceive, plan and produce a variety of multi-media publications, e.g., films, video tapes, slide shows, and brochures. Requires skill in at least two of the following: graphic design, photography, film, video, audio, specialized writing. Publications are designed in cooperation with University and community nonprofit organizations, are presented to and evaluated by a mass audience. May be repeated for up to 8 s.h. credit. Prerequisite: senior standing.

19:182 Special Topics in Communication 2-3 s.h.
Requires a research essay in which the student, through analysis and synthesis, treats a major communication-related issue or problem. Senior year only.

19:183 Readings in Communication and Mass Communication 1-3 s.h.
Reading and discussion focusing upon a problem or issue in mass communication. May be repeated. Signed consent of instructor must be obtained before registration.

19:194 Honors Seminar 1-2 s.h.
Through reading and small-group discussion a variety of issues in journalism and mass communication are examined. Honor students only.

19:195 Honors Readings 1-3 s.h.
Intensive reading on a student-selected topic pertaining to journalism or mass communication is combined with periodic discussions with a supervising faculty member and culminating in and "overview" paper. Honor students only. Signed consent of instructor must be obtained before registration.

19:196 Honors Project 1-3 s.h.
In consultation with a faculty supervisor student develops and completes an independent study project pertaining to journalism or mass communication. Honor students only. Signed consent of instructor must be obtained before registration.

19:200 Masters Seminar 1-3 s.h.
Section 1, for students in the M.A. professional program, investigates journalism as a mode of inquiry, conceptual approaches utilized by the journalist, professional and institutional problems in mass communication; Section 2, for students in the M.A. thesis program, introduces important concepts in the field of communication study through lectures, readings and discussions. Section 2 meets with Ph.D. Seminar.

19:201 Approaches to the Study of Communication: Issues and Concepts 2-3 s.h.
Introduction to major communication and mass communication concepts, use and development in seminar setting.

19:203 Approaches to the Study of Communication 3 s.h.
Designed to complement 19:200, this course will identify and explore a number of both quantitative and qualitative methods utilized in communication research with an emphasis being placed upon an explication of assumptions and philosophical issues pertinent to these methods.

19:205 Master's Practicum arr.
Participation in research activities with graduate faculty and/or practice in the media; provides forum for discussion of students work. Prerequisite: signed consent of instructor must be obtained before registration.

19:208 Theory of Popular Culture 3 s.h.
Analysis of the major theoretical approaches to the study of popular culture and an examination of representative studies, emphasizing the concept of cultures and publics.

19:211 Seminar: News-Editorial Problems 2-3 s.h.
Topics vary each semester; emphasis upon duties and responsibilities of mass media in contemporary society.

19:215 History of the Book 3 s.h.
Development of the book from 1450 to the present; materials, production methods and aesthetics; the social impact of the book; authorship, publishing and economics. Same as 8:203, 21:223.

19:231 Problems in International Communication 3 s.h.
Socioeconomic and political factors affecting international communication and relations in context of world affairs; communication systems in national development; international and cross-cultural communication structure and theory; images and values; mass persuasion; laws and agreements; information channels, content, flow and effect; censorship, language and literacy.

19:234 Advanced International/Comparative Communication Seminar arr.
Special topics in international and cross-cultural communication.

19:240 News Communication I: Principles and Practice 4 s.h.
Theory, principles and process involved in the communication of public affairs through the mass media; practice in news research methods, journalistic writing and editing, and publication. Prerequisite: 19:112.

19:241 News Communication II 3 s.h.
Team approach to the extended journalistic report; emphasis on integration of research, writing, graphic and photographic preparation of class project(s). Prerequisite: 19:240.

19:245 Specialized Reporting or Editing 2-3 s.h.
For graduate and advanced undergraduate students. Specialized reporting and writing projects or editing projects for selected media. Typically, sections offered in team project, newspaper, magazine, photography and broadcast/video project. Consent of instructor required.

19:251 Master's Research arr.
Principally for master's candidates working on projects and theses; signed consent of sponsoring staff member and of the director of graduate studies must be obtained before registration.

19:252 Seminar in Visual Communication 3-4 s.h.
Conceptual and theoretical approaches for analyzing visual media are developed and discussed in relation to research on historical and cultural aspects of visual communication. Prerequisite: consent of instructor.

19:261 Communication and Individual Community and National Development 3 s.h.
Focuses on problems of communicating health, agriculture, family planning, and similar innovations, particularly in third-world nations. Pays specific attention to theories and research having a bearing on cross-cultural diffusion of innovations and makes a strong effort to illustrate problems with practical examples and experiences. Goal is to explore possible strategies of communication to accelerate the process of diffusion of innovations.

19:263 Communication and Social Theory 3 s.h.
Concerned with social theorists who emphasize communication processes in their perspectives on social interaction and society. Treats aspects of the Chicago School of Social Thought, its intellectual antecedents and consequents.

19:265 Mass Communications in Modern Society: Contemporary Issues 2-4 s.h.
Concept of mass communications; rights and responsibilities of parties involved; public opinion; interaction of mass media and society; government, politics, world affairs and mass communications; mass media as institutions and as systems: mass media and social change.

19:266 Seminar: Mass Communications and Society 2-4 s.h.
Political, economic and social factors influencing content and character of mass media; ethics, rights and responsibilities of mass communication media; place of mass media in social change and social planning.

19:270 Seminar on News 3 s.h.
Examination of the way in which the concept of news has been studied, drawing chiefly on social and historical research and including such areas as attempts to define news, contemporary criticism of news, processing news, studies of correspondents, analyses of news from phenomenological and Marxist points of view.

19:280 Human Rights and World Community arr.
Same as 30:365, 32:280, 45:361.

19:290 Communication Research: Historical Approaches 2 s.h.
An introduction to historical methods in communication research, the course is designed to provide students with a theoretical framework for the study of communication and mass communication phenomena.

19:291 Communication Research: Behavioral Approaches 2-3 s.h.
Introduction to communication inquiry using behavioral science research methodology. Selected analytic tools, approaches, models and methods will be reviewed through readings, lectures, demonstrations and worked examples.

19:300 Ph.D. Seminar 1 s.h.
Required of all doctoral students during residence.

19:301 Ph.D. Research Practicum arr.
Required of all doctoral students beginning second semester in residence. Signed consent of instructor required at registration.

19:302 Ph.D. Tutorial arr.
Signed consent of instructor required at registration.

19:303 Dissertation arr.

19:304 Research Practicum in Simulation 2-3 s.h.
Study of the theory and practice of gaming; participants develop projects focusing on research strategies for measuring outcomes of instructional simulations and games, or on the use of simulations and games in theory-generation and testing.

19:305 Seminar: Practicum in Multivariate Communication Theory and Research 2-3 s.h.
Philosophy, theory and methods in the study of communication behavior. Special emphasis on clustering and pattern analytic devices: Stephenson's Q methods, factor analysis, McQuitty's pattern analysis, scaling, Guttman's facet analysis, Coombs' theory of data, etc. Students design and complete small communication studies, review relevant social science literature, and develop, synthesize and apply theory to communication problems.

19:306 Literature of Communication arr.
Review and discussion of significant works in communication and mass communcation theory. Selections may vary each semester.

19:308 Seminar in Organizational Communication Theory 2-3 s.h.
Examination of major theoretic approaches to the study of organizing and organization, focusing on communication as the basic process in human ordering, planning and acting. Participants are expected to produce publishable papers. Same as 36:635.

19:309 Mass Communication and Cultural Theory 3 s.h.
Examination of basic theoretical approaches to mass communication emphasizing the role of cultural traditions in shaping the mass media. Attention to contemporary British and continental scholarship.

19:310 Research Practicum: Communication History 2-3 s.h.
Study in and practice of research methods in communication and mass communication history and biography including the production of history papers and/or publishable articles for scholarly journals and upperlevel commercial publication.

19:395 Seminar: Communication and Change 2-4 s.h.
Theory, research, methodological problems of studying change; topics covered include diffusion, innovation, media and change, reform organizations, revolutionary organizations and evolutionary organizations. Same as 34:395.

Iowa Lakeside Laboratory

Director: Richard V. Bovbjerg
Faculty: *professors* Richard V. Bovbjerg (Zoology, The University of Iowa), Robert W. Cruden (Botany, The University of Iowa), John D. Dodd (Botany, Iowa State University), Lawrence J. Eilers (Biology, University of Northern Iowa), John N. Farmer (Biology, University of Missouri-Columbia), William J. Platt (Biology, Florida State University), Lois H. Tiffany (Botany, Iowa State University), Martin J. Ulmer (Zoology, Iowa State University)
assistant professors Donald R. Farrar (Botany, Iowa State University), David W. Fredericksen (Biology, Tulane University), Martha Whitson (Biology, University of Northern Iowa)
associate professor Arnold G. van der Valk (Botany, Iowa State University)
other Charles W. Reimer (curator, Limnology Department, Academy of Natural Sciences)

The Iowa Lakeside Laboratory is a biological field station comprising approximately 100 acres of grassland and gallery forest along the west shore of Lake Okoboji in northwest Iowa.

The laboratory was established in 1909 under the leadership of Thomas H. Macbride, whose eminence as a University of Iowa botanist and geologist 1878-1914 was recognized in his elevation to the University presidency 1914-1916. The Lab site was the first area set aside for the conservation and study of the rich flora and fauna of the northern Iowa lake and prairie regions.

Since 1947, The University of Iowa has cooperated with Iowa State University and the University of Northern Iowa in the Lab program. Representatives of the three schools make up the advisory board which determines the scientific and educational policies of the Lab.

Teaching Program

The Iowa Lakeside Laboratory offers coursework in two five-week terms during the summer session.

Enrollment is limited to one course, for five semester hours of credit, per term.

The Laboratory gives serious students—advanced undergraduate and graduate—the opportunity to meet directly the conditions of plant and animal life in their natural setting. Study therefore supplements, and does not replace, regular coursework given formally by accredited colleges.

Students working for advanced degrees will find excellent opportunities for development of thesis projects.

Teaching and research facilities include seven laboratories and a lecture hall. Living accomodations include cottages, dormitories and a large mess hall.

Financial Aid

The University of Iowa has established several Thomas H. Macbride Scholarships in Natural Science for undergraduate and graduate students attending the Lakeside Laboratory. The scholarships cover tuition. Applications close April 1.

Registration

Current or former students of the three cooperating universities should ask their registrars for particulars. Students from other institutions must apply for admission to one of the three cooperating universities; each has a provisional admission policy for students who wish to register for summer work only.

Early registration is advisable. All applications should be completed before May 1.

Courses

Permission of instructor required for all courses. Enrollment limited to six students in all courses except field biology, for which the limit is 16. Classes meet all day, every day.

Courses vary from year to year (see annual Lakeside Laboratory bulletin); the following are representative.

L:101 Field Biology 5 s.h.
Introduction to ecology and natural history, involving field studies in local systems, laboratory analyses, discussion of concepts, methods, overview of plants and animals of the region. For students with some background in biology, who want field experience.

L:103 Aquatic Ecology 5 s.h.
Local aquatic plants and animals, analyses of ecosystems; stresses basic ecological principles; field work and methods meshed with theory, but the course is not technical limnology. For students with broad biological backgrounds, including some ecology, chemistry, physics.

L:104 Aquatic Ecology 5 s.h.
Individual project work.

L:105 Plant Taxonomy 5 s.h.
Basic principles of classification and evolution of vascular plants. Taxonomic tools, techniques, and the native flora will be explored. Field collections and group projects will be stressed.

L:107 Helminthology 5 s.h.
Structure, life cycles, and host-parasite relationships of representative helminths; methods of collecting and identifying local helminths; experimental studies of life cycles; methods for studying living materials; special techniques for research in helminthology. Intended for students having had some background in vertebrate anatomy and invertebrate zoology.

L:108 Protozoology 5 s.h.
Biology of the protozoa, with emphasis upon the morphology, physiology, systematics, and ecology of free-living and parasitic forms. Collection, culture, and classification of local specimens; experimental work to be included.

L:109 Freshwater Algae 5 s.h.
Region is one of world's richest freshwater algae collecting areas. Class makes collections daily for immediate laboratory examination; text descriptions correlated with students' observations of living material. For graduate and advanced undergraduate students with demonstrated interests in biological and/or related sciences.

L:110 Field Invertebrate Zoology 5 s.h.
Emphasis on local freshwater and terrestrial forms, their structure, systematics, behavior; methods of collecting, culturing, preserving, identifying, with stress on study of living material. For students with background in invertebrate zoology.

L:111 Research arr.

L:112 Research arr.

L:113 Independent Study arr.

L:114 Independent Study arr.

L:115 Field Mycology 5 s.h.
Identification and classification of the common fungi. The varied habitats in the region afford collecting areas for many different kinds of fungi. Techniques for identification, preservation, and culture will be practiced with members of the various groups.

L:117 Ecology and Systematics of Diatoms 5 s.h.
Field experience in study of freshwater diatoms from a variety of habitats; stresses environmental factors affecting growth and distribution, techniques in collection and preparation of diatom samples.

L:118 Field Entomology 5 s.h.

L:119 Field Biology of Bryophytes and Pteridophytes 5 s.h.
Field work deals with collection and identification of

species, analysis of their habitats. For graduate and advanced undergraduate students with background in botany.

L:121 Field Acarology 5 s.h.

L:124 Aquatic Vascular Plants 5 s.h.
Field studies of selected wetland communities. Emphasis will be placed on identification and examination of environmental factors controlling distribution. Individual or group projects. Intended for students with some background in either botany or ecology.

L:125 Biology of Mollusks 5 s.h.

L:126 Avian Ecology and Behavior 5 s.h.
Basic principles and field study of the ecology and behavior of birds; utilizes techniques for analyses of behavioral interactions, populations, habit structure. Field project required. For students with some background in ecology.

L:127 Aquatic Entomology 5 s.h.

Latin

See "Classics."

Letters

Committee chair: Alan Nagel
Faculty: *professors* Stavros Deligiorgis (English and Comparative Literature), Marleigh G. Ryan (East Asian Languages and Literature)
associate professors J. Dudley Andrew (English and Film), Erling B. Holtsmark (Classics), R.E. Kuenzli (English and Comparative Literature), Alan F. Nagel (English and Comparative Literature), Ford B. Parkes (German), Ray J. Parrott (Russian), Harry B. Weber (Russian), Robert F. Woerner (English)
assistant professors Janet G. Altman (French and Italian), Roslyn M. Frank (Spanish and Portuguese), Sheldon I. Pollock (East Asian Languages and Literature), James P. Pusack (German), Steven Ungar (French and Italian, Comparative Literature)
Degrees offered: B.A.

The baccalaureate program in letters takes as its subject the field of literature, without presumed limits of a historical, national, or linguistic kind. By its international orientation, the major provides an alternative to courses of study in a single national language and literature. The program is interdepartmental, and the student typically pursues courses offered in at least three different departments in completing the B.A. degree.

The study of literature may be tightly focused on questions of what literature is in and for itself, of what it is for man to tell stories, recite poems, or write what will be read by others from the printed page. It is equally possible for students of literature to raise questions of broader kinds, to investigate the relation of literary production and artifacts to other kinds of thought and action in culture, society, and history. Authors and readers alike give their attention to literary works of many kinds in their native languages, in foreign languages and in translations. Letters, speaking, gesturing, reading—our different means of communication have much in common. The undergraduate program in the School of Letters offers a way to discover the variety of literature both in one's own private life and in the lives of people from other languages and times.

The program is not exclusively preprofessional. For many students, the major provides a general course of study in the humanities with considerable freedom to create one's own concentration. Students looking forward to teaching world literature in translation or general literary subjects and those intending to pursue graduate study in comparative or national literature may choose the B.A. in letters. Future professionals in such fields as medicine and law may find the major a satisfying concentration toward the B.A.

The program of study for the B.A. in letters encourages the undergraduate student to work closely with one or more advisers in developing an individual course of study. A typical student might study classical and modern theater, oral literature and fiction from several countries; or he or she might include work in film or practice in printing on a hand press. The major in letters requires that a student do work in three different national literatures or literary traditions, with some experience of historical diversity. Students doing all their reading in English and translation must complete at least 36 hours of coursework in literary subjects; students who complete at least six hours of study in a foreign literature in the orginal language are required to take a total of at least 30 hours in literature for the B.A. Appropriate courses in linguistics, creative writing, translation and interdisciplinary studies concentrating on literary materials may be included toward completion of the major.

There are no requirements for admission to the major; interested students should see the chair or one of the advisers to the major.

Courses

International or Comparative Themes and Problems

108:25 Crosscurrents in Western Literature 3 s.h.

108:26 Crosscurrents in Modern Literature 3 s.h.
Introductory courses in the international study of literature; specific topics selected for each semester vary, while always including texts from several countries on a common theme or in a common range of literary form; topics 1974-78 included literature and psychology, literature and death, literature and philosophy, poetry and song, and fictions of the self. Open to freshmen. No language requirement.

108:94 Language, Literature, and Medicine 3 s.h.
Team-taught by School of Letters and medical faculty, for nonmajors and students of literature alike, concentrating upon the representation of disease and upon issues important to the history and practice of medicine in selected literary works; other topics may include the physician as humanist and writer, language in the diagnostic interview, culturally favored diseases, and language as a part of treatment. Discussion course with tutorials on student writing. Same as 8:94.

108:98 Honors Seminar 3 s.h.
Topic varies. Close readings of complex literary works from different national traditions, with specific emphasis on formal, historical, and cultural contexts.

108:116 History and Theory of Translation 3 s.h.
Same as 8W:116, 48:116.

108:131 Western Literatures 3 s.h.

108:132 Western Literatures 3 s.h.

108:133 Western Literatures 3 s.h.

108:134 Western Literatures 3 s.h.
Team-taught study of the variety of western literatures; in any particular semester, might concentrate on a literary genre or mode, e.g. narratives, or on a literary period or periods.

108:150 Literature and Society 3 s.h.
Same as 48:150, 8:179.

108:157 Literature and Anthropology 3 s.h.
Same as 8:151, 48:151, 113:109.

108:158 East-West Literary Relations 3 s.h.
Same as 39:158, 48:158.

108:162 Literature and Revolution 3 s.h.
Same as 48:162.

108:167 Literature and Psychology 3 s.h.
Same as 8:175, 48:167.

108:171 The French Writer and Social Criticism 3 s.h.
Same as 48:171.

108:174 Changing Concepts of Women in Literature 3 s.h.

108:175 Women in Literature 2-3 s.h.

108:183 The Faust Tradition in Western Civilization 3 s.h.
Same as 13:183.

108:188 Zen and Literature 3 s.h.
Same as 39J:101.

Literary-Historical Periods

108:80 Communication and Contemporary Culture 3 s.h.
Same as 122:80, 36R:80.

108:110 European Literature of the 19th Century 3 s.h.
Same as 48:106, 8:109.

108:112 Contemporary Latin American Novel and Short Story 3-4 s.h.
Same as 35:112.

108:125 Contemporary Scene in Poetry 3 s.h.
Same as 8:127, 48:127.

108:192 Dante and Romance Poetry 3 s.h.
Same as 48:192, 8:192.

National or Ethnic Traditions

108:19 Asian Humanities 4 s.h.
Same as 39:19, 11:19.

108:20 Asian Humanities 4 s.h.
Same as 39:20, 11:20.

108:104 The Third Reich and Literature 3 s.h.
Same as 13:104.

108:108 Yiddish Literature in Translation 3 s.h.
Same as 13:108.

108:109 Black Literature of Portuguese Expression 3 s.h.
Same as 38:108, 45:108.

108:113 Africans in the New World 3 s.h.
Same as 46:113, 113:113.

108:114 Introduction to Basque Language and Culture 3 s.h.
Same as 35:140.

108:115 Basque Language and Culture II 3 s.h.
Same as 35:142.

108:119 African Literature 3 s.h.
Same as 45:119, 8:119.

108:120 Modern African Novel 3 s.h.
Same as 45:182.

108:123 Women in German Literature 3 s.h.
Same as 13:123.

108:127 Chicano Literature 2-3 s.h.
Same as 35:127, 8:118.

108:147 Asia: Half the World 3 s.h.
Same as 39:193, 113:193.

108:148 Asia: Half the World 3 s.h.
Same as 39:194, 113:194.

108:184 Introduction to the French-Speaking World 3 s.h.
Same as 45:135, 9:163.

Literary Forms and Genres

108:105 Classical Mythology 2-3 s.h.
Same as 14:112.

108:106 The European Novel: 1850-Present 3 s.h.
Same as 8:139.

108:107 Spanish American Literature of Fantasy 3 s.h.
Same as 35:107.

108:126 Literary Genres in European Literature II 3 s.h.
Same as 8:126, 48:115.

108:138 The European Novel 1700-1850 3 s.h.
Same as 8:138.

108:155 The Literary Tale 3 s.h.
Examination of structural features and social implications of the mode of oral storytelling in written literature. Reading list includes both Western and Asian texts. Same as 39:155, 48:155.

108:165 Continental Drama: 1500-1700 3 s.h.
Same as 8:165, 36T:175.

108:173 Literature and the Film 2-3 s.h.
Same as 8:173, 36B:155.

108:176 Continental Drama: 1700 to 1850 3 s.h.
Same as 8:159, 36T:176.

108:191 Narrative and Related Art Forms 3 s.h.
Same as 8:172, 36B:158.

Theory and Practice of Criticism

108:130 Rhetorical Criticism 3 s.h.
Same as 36R:130.

Independent Study and Honors

108:99 Honors Tutorial arr.

108:198 Honors Project in Letters arr.

108:199 Independent Study in Letters arr.

108:450 Seminar Modern Letters 3 s.h.

Library Science

Director of School: Frederick Wezeman
Faculty: *professors* Velva Jeanne Osborn, Frederick Wezeman
associate professor Mildred Laughlin, Carl Orgren
associate professor emeritus Louane L. Newsome
assistant professors Robert Swisher, Terry Weech
lecturers Ethel Bloesch, Barbara Poston
adjunct assistant professors Thomas Carney, Edwin Holtum, Gene Klimstra
Affiliated faculty: Dale M. Bentz, G. Robert Carlsen, Leslie W. Dunlap, George Strait, Jerry Watson
Degree offered: M.A.

The School of Library Science offers a program of basic professional preparation for careers in all types of libraries—public, school, academic, and special. It seeks to recruit and prepare librarians, to provide public service and to contribute to the advance of librarianship through research.

Instructional Objectives

To introduce students to a basic understanding of the history and theory of librarianship, the changing role of the library in today's society and the library's importance in the communication process.
To help students develop a philosophy of librarianship which includes a commitment to the cause of intellectual freedom and to the ideal of free dissemination of information; a professional attitude toward the librarian's role as facilitator between user and material; and a determination to improve the quality of library service in response to the needs of the people to be served.
To provide students with a foundation in the techniques and procedures of effective library service (i.e., the selection, acquisition, organization, storage, retrieval and dissemination of information).
To familiarize students with bibliographic techniques and sources of information in a broad range of subject fields and media formats.
To introduce students to management theory as it applies to library administration and to prepare the student to assume professional responsibilities of identifying needs, setting goals, analyzing problems and formulating solutions.
To provide students with opportunities for clinical library experience under supervised direction and the pursuit of related courses of study to meet special career needs.
To increase awareness of the contributions of other disciplines to librarianship, a critical understanding of the role of research in the advancement of the profession, and the importance of continuous professional growth.

Public Service Objectives

To offer all library personnel and library trustees opportunities for continuing education to advance and update their awareness of current developments in library operations and services.
To provide consulting services to individuals, libraries and organizations in order to promote better library service for the citizens of Iowa and surrounding areas.
To participate in professional organizations at local, state, regional and national levels in the pursuit of common goals within the profession.

Research Objectives

To engage in systematic and continuing research on library problems and areas related to library service which advance both the theoretical and practical knowledge of librarianship.
To give emphasis to research which directly supports the instructional program of the School of Library Science or which may have special relevance to library service in the State of Iowa.

Undergraduate Study

Although there is no undergraduate major in library science, juniors and seniors may

enroll in the introductory library science and children's literature courses (100-level).

The Master of Arts Program

Professional preparation for careers in all types of libraries is provided by the School's Master of Arts program, accredited by the American Library Association.

The School also offers a nondegree graduate program for certification in school librarianship.

Its graduates hold positions, in approximately equal numbers, in public, school and academic libraries, serving in such roles as administrators, bibliographers, catalogers, reference specialists or children's librarians.

The Master of Arts degree in library science requires 33 semester hours of graduate credit with a minimum grade-point average of 2.5. In addition, the student must pass a comprehensive examination. The program consists of a small core of required courses basic to all areas of librarianship, additional required courses in a type of library and in bibliography, and electives. The plan of study should be related to developing special competencies in a particular field of librarianship.

Basic Plan of Study

Core courses (required of all M.A. candidates) 9 s.h.
21:151 Reference I
21:152 Cataloging and Classification
21:153 Selection of Library Materials

Type-of-library course (one required) 3 s.h.
21:231 The Public Library
21:232 The College and University Library
21:233 School Media Center Administration

Bibliography course (one required) 3 s.h.
21:241 Bibliography of the Humanities
21:242 Bibliography of the Social Sciences
21:243 Bibliography of the Sciences

Electives 18 s.h.

Students are expected to take their elective hours in library science courses. However, when a student has had extensive undergraduate coursework in library science, when career objectives so indicate, and with the adviser's consent, the student may take elective hours in other University departments, especially in closely related areas such as computer science, educational media, urban and regional planning, municipal government, etc.

With the director's approval, a student with a strong background in library science may elect to write a thesis, for which six semester hours of credit may be earned. However, most students are advised to undertake the nonthesis program.

The program normally requires two semesters and one summer of resident study, or, in the case of students attending summers only, a minimum of four summer sessions.

Public Library Work

A major concern of public librarians is to design innovative service programs to reach those segments of the population now unserved, as well as to provide a full range of services to all members of the community. Management skills are often needed in these positions.

Required courses

Core courses
Bibliography course
21:231 The Public Library

Suggested electives

21:213 Library Services to Adults
21:222 Multi-Media Concepts in Libraries
21:246 Introduction to Information Science
21:249 Research Methods
21:251 Advanced Reference
21:252 Advanced Cataloging
21:263 Problems in Library Management
21:282 Practicum in Libraries
Additional bibliography courses
Courses relating to service to children and young adults (21:123, 21:124, 21:126, 21:193, 21:234)

School Library Work

The school media center makes a wide range of print and audiovisual materials accessible to students and teachers. The work of the media specialist includes such activities as providing instruction to students in the use of media, consulting with teachers about the use of media in the teaching program, producing new materials, offering reading guidance and providing reference service.

State certification is required for a career as a librarian in elementary and secondary schools.

Required courses

Core courses
Bibliography course

21:222 Multi-Media Concepts in Libraries
or
Equivalent audiovisual course

21:233 School Media Center Administration

Suggested electives

21:123 Children's Literature
21:124 History of Children's Books
21:126 Literature and Storytelling for Children
21:193 Literature for Adolescents
21:222 Multi-Media Concepts in Libraries
21:234 Library Services to Children and Young Adults
21:249 Research Methods
21:251 Advanced Reference
21:262 School Media Center Problems
21:282 Practicum in Libraries
7S:281 Junior High School and Middle School Curriculum
7S:291 Secondary School Curriculum
Additional courses in educational media

College and University Library Work

The academic library, whether in a community college or a university, provides service to students, faculty and staff relating to their information, education and research needs. Management or supervisory responsibility is often required. Special competencies may be called for, such as a subject or language specialty or an activity specialty (classification and indexing, information systems, etc.).

Required courses

Core courses
Bibliography course
21:232 The College and University Library

Suggested electives

21:246 Introduction to Information Science
21:249 Research Methods
21:251 Advanced Reference
21:252 Advanced Cataloging
21:255 Government Publications
21:263 Problems in Library Management
21:264 Medical Librarianship and Bibliography
21:265 Law Librarianship, Bibliography and Research Techniques
21:282 Practicum in Libraries
Additional bibliography courses

Work in Special Libraries

Special libraries function in such settings as government agencies, industrial firms, hospitals, museums and publishing companies. In addition to management skills, the special librarian often needs a subject specialty.

Required courses

Core courses
Bibliography course
Type-of-library course
21:230 Special Libraries

Suggested electives
21:246 Introduction to Information Science
21:249 Research Methods
21:251 Advanced Reference
21:252 Advanced Cataloging
21:255 Government Publications
21:263 Problems in Library Management
21:264 Medical Librarianship and Bibliography
21:265 Law Librarianship, Bibliography and Research Techniques
21:282 Practicum in Libraries

Certification in School Librarianship

Students who desire to become school librarians may fulfill certification requirements within the M.A. program, or they may pursue a non-degree certification program. The certification program, a 30-semester-hour sequence, accepts both undergraduate and graduate coursework, and does not require a foreign language for admission.

The required courses and suggested electives are the same as those listed above under School Library Work, except that a bibliography course is not required.

The student must hold an approved teaching certificate, either at the elementary or the secondary level. Completion of the certification program provides authorization to serve as librarian K-12.

Joint Program in Business Administration and Library Science

Today's professional librarian faces ever-increasing demands for knowledge and expertise in the functional areas of administration and management. In addition to understanding the principles of library science, the librarian, whether in an academic or public setting, is discovering the importance of understanding and applying the principles for effective management of complex organizations. In order to offer students an opportunity to gain a solid understanding of the problem-solving techniques of each area, the College of Business Administration and the School of Library Science have developed a joint program which leads to two degrees—the Master of Business Administration (M.B.A.) and the Master of Arts (M.A.) in library science.

To enroll in the joint program the student must apply to and be accepted by both Graduate Studies in Business and the Library School. The joint program enables the student to apply six semester hours of business electives toward the M.A. in library science and nine hours of library science toward the M.B.A. A minimum of 60 hours must be completed in order to receive the two degrees. Students not having previous coursework in business administration may be required to complete up to 72 hours in the joint program.

Facilities and Resources

Quarters for the School of Library Science in the south wing of the University's Main Library provide well-planned facilities for the varied instructional and research activities of the School.

A media lab provides equipment and space for slide-tape production, videotape programming, super-8 filmmaking, filmstrip production, drymounting, 16mm film previewing, and simple film editing.

Computer facilities include an on-line lab with two CRT terminals and one printing terminal, providing access to the University's CYBER system, national bibliographic data bases, and OCLC (a national on-line library network).

A teletype links the School with a state network of academic and public libraries, by which students provide back-up reference service to libraries throughout the state.

A departmental library contains approximately 10,000 volumes and 200 periodical titles.

All of the resources of the University Libraries are available to students and faculty of the School. The system contains more than two million volumes in the Main Library and 12 departmental branches.

In addition, students have access to a variety of libraries for clinical and laboratory purposes: the State Historical Society Library in Iowa City; the Iowa City and Cedar Rapids public and school libraries; the Coe, Cornell and Grinnell college libraries; and, by arrangement, the Herbert Hoover Presidential Library in West Branch, Iowa.

Placement

Prospective students are advised that since the job market for entry-level librarians has diminished, graduates with strong personal and academic qualifications, flexibility, and geographic mobility will be most successful in finding positions. The School provides placement assistance to its graduates seeking employment.

Financial Assistance

The School of Library Science annually awards several partial-tuition scholarships, as well as quarter-time graduate assistantships. Prospective students are urged to apply for these awards before March 1. Students interested in part-time employment should contact the libraries of the Iowa City area.

Admission Requirements and Procedures

Scholastic requirements for admission to the M.A. program include:

A baccalaureate degree from an accredited college or university, with a minimum grade-point average of 2.5 on a 4.0 scale, and at least 85 semester hours of study in the liberal arts and sciences;
One year of college credit in a foreign language with a grade of C or better or an equivalent level of achievement;
Satisfactory scores on the Graduate Record Examination Aptitude Test.

Personal qualifications and aptitude for library work are assessed by means of letters of recommendation and a personal interview with the director of the School or the director's assistant, and a member of the faculty. The School does not accept every applicant who meets the minimum admission requirements; an admissions committee selects each class on a competitive basis. The applicant's professional promise is an important consideration.

Applicants are requested to write to the School of Library Science for a Preliminary Information Form. If this information indicates satisfaction of the basic admission requirements, the School will schedule a personal interview. Prospective students are urged to begin application procedures early enough to complete all requirements by the deadlines given below. More time needs to be allowed if the GRE Aptitude Test has not already been taken.

Completed applications must be received by the School not later than March 1 for fall semester consideration, October 1 for the spring semester, or February 1 for the summer session. Decisions of the admissions committee are announced 2-3 weeks after each deadline.

Courses

21:123 Children's Literature 3 s.h.
Same as 7E:123.

21:124 History of Children's Books 3 s.h.
Development of literature for children from oral tradition to present. Includes trends in content and illustrations, sharing of classics of past. Offered spring term. Prerequisite: 21:123 or consent of instructor.

21:126 Literature and Storytelling for Children 3 s.h.
Same as 7E:126.

21:151 Reference I 3 s.h.
Landmark bibliographic and reference works common to most libraries; dictionaries, encyclopedias, biographical works, book catalogs, indexes and guides to periodical literature, yearbooks, dictionaries and handbooks.

21:152 Cataloging and Classification 3 s.h.
Arrangement of materials for effective retrieval; bibliographic description under the Anglo-American Code; subject organization, stressing Dewey and Sears; use of cataloging aids and services; analysis of OCLC formats and techniques.

21:153 Selection of Library Materials 3 s.h.
Philosophical issues relating to policies for the development and maintenance of library collections; tools and procedures used by librarians in implementing selection policy.

21:154 Introduction to Librarianship 3 s.h.
Librarianship as a profession; library development from ancient times; overview of types of libraries; current library trends and agencies.

21:193 Literature for Adolescents 3 s.h.
Same as 7S:193, 8P:198.

21:213 Library Services to Adults 3 s.h.
Survey of high interest adult materials in regard to programming and collection development; books read and discussed in fiction and various non-fiction areas. Offered alternate terms. Prerequisite: 21:153.

21:222 Multi-Media Concepts in Libraries 2-3 s.h.
Nature and scope of library service beyond printed materials in school, public and academic libraries; includes utilization and basic production.

21:223 History of the Book 3 s.h.
Development of the book from 1450 to the present; materials, production methods and aesthetics; the social impact of the book; authorship, publishing and economics. Same as 19:215, 8:203.

21:230 Special Libraries 2-3 s.h.
Organization and administration of libraries devoted to serving a special clientele, defined either in terms of a subject field or an organization. Offered fall term. Prerequisites: 21:151-153.

21:231 The Public Library 3 s.h.
Survey of the development of the modern public library as a social agency in American society, emphasizing organization and administration, current trends and problems. Offered alternate terms. Prerequisites: 21:151-153.

21:232 The College and University Library 3 s.h.
Objectives, function, organization, and administration of academic libraries of several kinds and sizes; standards, principles, problems and trends. Offered alternate terms. Prerequisites: 21:151-153.

21:233 School Media Center Administration 3 s.h.
Organization and administration of media programs at school and district levels. Includes objectives, planning and evaluating programs and facilities, budgeting, personnel management. Offered alternate terms. Prerequisites: 21:151-153.

21:234 Library Services to Children and Young Adults 3 s.h.
Theory and practice of library service in elementary and secondary schools and of library work with children and young adults in the public library. Offered fall term. Prerequisite: 21:123 or 21:193.

21:241 Bibliography of the Humanities 3 s.h.
Special reference sources and selection aids in philosophy, religion, fine and applied arts, music, literature and other closely related areas. Offered alternate terms. Prerequisite: 21:151.

21:242 Bibliography of the Social Sciences 3 s.h.
Special reference sources and selection aids in anthropology, business, economics, education, geography, history, political science, sociology, psychology, and other closely related areas. Offered alternate terms. Prerequisite: 21:151.

21:243 Bibliography of the Sciences 3 s.h.
Building and servicing collections in science and technology; basic reference tools; government sources; periodical and other serial titles; survey of major disciplines and their literature. Offered alternate terms. Prerequisite: 21:151.

21:246 Introduction to Information Science 3 s.h.
Methodology and techniques of information science, and library applications; current practices and problems relating to storage and retrieval of information by manual, mechanical, electronic means. Offered alternate terms.

21:249 Research Methods 3 s.h.
Concepts and statistical techniques employed in library and information science research; procedures for conducting research; critical analysis of existing research. Offered alternate terms.

21:251 Advanced Reference 3 s.h.
Concepts in reference service: philosophy, communication, bibliographic instruction, evaluation. Students staff statewide telatype reference service. Sources emphasized are in law, business, statistics and government publications. Prerequisite: 21:151.

21:252 Advanced Cataloging 2-3 s.h.
Library of Congress classification and subject headings; uniform titles; serials; special types of materials; reclassification and other administrative problems; internationalization of criteria for bibliographic description; on-line cataloging experience at OCLC terminal. Prerequisite: 21:152.

21:254 Advanced Bibliography 3 s.h.
National and trade bibliographies of the world; concentration on those of United States, Great Britain, France, Germany, Russia, considered from the acquisition and subject bibliography viewpoint. Offered alternate summers. Prerequisite: 21:153.

21:255 Government Publications 3 s.h.
Federal, state and local U.S. government publications, as well as international, U.N. and foreign publications, studied as information resources; special problems of organization and administration of government publications. Offered spring term. Prerequisite or corequisite: 21:251.

21:262 School Media Center Problems 2-3 s.h.
Seminar and field experience in analysis of special problems encountered in supervision of media center; preparation and presentation of one major research project. Offered alternate terms. Prerequisite: 21:233 or consent of instructor.

21:263 Problems in Library Management 2-3 s.h.
Administrative theory and decision making; personnel management; budgeting and fiscal operations; communications; measurement, evaluation and reporting; automation of library systems. Offered fall term. Prerequisite: 21:231 or 21:232 or 21:233 or consent of instructor.

21:264 Medical Librarianship and Bibliography 3 s.h.
Types of medical libraries; characteristics of the literature; selection and organization of library materials; evaluation and use of reference and bibliographic tools; current awareness services. Offered spring term. Prerequisites: 21:151-153.

21:265 Law Librarianship, Bibliography and Research Techniques 3 s.h.
Types of law libraries; characteristics of the literature; selection and organization of legal materials; use of reference and bibliographic tools; research techniques via clinical approach. Offered fall term. Prerequisites: 21:151-153.

21:272 Current Topics in Librarianship 1-3 s.h.
Investigation and analysis of contemporary issues and problems in library and information services.

21:278 Workshop in Library Science 1-3 s.h.
Short-term intensive study of selected topic or problem. Offered summers only.

21:282 Practicum in Libraries **2-3 s.h.**
Clinical experience under professional direction in selected libraries; evaluation and discussion in seminar meetings. Prerequisite: 12 semester hours in library science, or consent of instructor.

21:293 Individual Instruction in Library Science **arr.**

21:299 Thesis **6 s.h.**
Prerequisite: consent of director.

Linguistics

Department chair: Robert S. Wachal
Faculty: *professors* Andreas Koutsoudas, John C. McLaughlin, Robert S. Wachal
assistant professors David A. Hacker, Gregory K. Iverson, Karen A. Mullen, Catherine O. Ringen
Degrees offered: B.A., M.A., Ph.D.

Linguistics has evolved from a humanistic discipline into one of the social-behavioral sciences, sciences which objectively study the organizing principles underlying human activities.

There are many indicators that such organizing principles exist in language. Children normally learn to use their native language before they enter school, and without much direct instruction. People can speak and understand sentences they have never heard before. All languages have several ways of saying the same thing and all have ambiguities. All languages change through time. Damage to a particular part of the brain may be related to a particular type of linguistic problem, whatever the language. All languages are systems with some unique properties, some universal properties, and some properties shared with other languages which may or may not be historically related.

Linguists do not attempt to learn many languages. Rather, they consider the languages of the world as data to be analyzed by common principles.

Linguistics is a science with many laboratories. One linguist's laboratory may be his or her mind and a pencil and paper. Another may work with acoustical equipment. Others need computers. Some go into seldom visited places to study, describe, and analyze little-known languages which may be in danger of extinction. Some go into their own communities to study the relationship between language variation and socio-economic structure, or race, or sex. Still others, interested in language change, spend time studying ancient languages.

Linguistics is not limited to scientific research for its own sake. Linguists may teach English as a foreign language. They may help design school programs which are relevant for Chicanos, blacks and native Americans. They may help intelligence and achievement test-makers avoid discrimination against non-middle-class white Americans, or help librarians use computers to manage massive amounts of information. They may work with speech clinicians to retrain people with linguistic disabilities.

Undergraduate Program

Because language is a medium of informational, emotional and aesthetic communication, yet can be analyzed scientifically, a major in linguistics embodies all the virtues of a liberal arts education.

High scores on verbal and quantitative aptitude tests are indicators of success in linguistics. Although few aspects of the field deal with numbers, it is very important to be able to reason logically and explicitly, and to be able to deal with formulae and abstract symbols.

From the standpoint of vocational goals, prospective linguistics students should consider either pursuing their study through the M.A. in linguistics with a professional focus, or through the doctorate, or they should take a second major. Appropriate companion fields include foreign languages, English, anthropology, sociology, speech pathology, psychology, mathematics, computer science, philosophy, and elementary, secondary and special education.

The Bachelor of Arts degree in linguistics prepares the student to do basic language analysis in syntax-semantics (sentence word patterns and their relation to meanings) and phonology (sound patterns). Elective courses in a variety of subspecialties enable each student to tailor a program to his or her own interests.

The major in linguistics requires 24 semester hours of work in the Department. It includes a general introduction, and courses in syntax, phonetics, phonology, methods of analysis and language history.

Graduate Programs

Emphasis in all graduate programs is on theory and research. Students interested in nonuniversity careers may also take advantage of a number of courses in applied linguistics or in other fields, either in connection with doctoral work or as a standard option of the M.A. program.

Master of Arts in Linguistics

All students take a required set of core courses followed by comprehensive examinations in phonology and syntax-semantics. Students choosing to write a thesis take at least nine semester hours of elective coursework. Students choosing to take a degree without thesis must do a focus area (consisting of 12 hours of coursework and a comprehensive examination) and take at least three semester hours of elective coursework. The major purpose of the focus area is to qualify the student for immediate career opportunities. The focus may either be designed in advance by the student (subject to departmental approval), or be one of a set of predesigned options (e.g. Teaching English as a Foreign Language). All electives must be chosen from an approved list furnished by the Department. Students without prior training in linguistics should expect either to take 33 hours of coursework and write a thesis or to take 39 hours of coursework. All students must have a minimum of 30 hours of graduate credit to receive the degree, regardless of prior preparation.

The Ph.D. Program

The aims of the Ph.D. program are to develop highly competent graduates in theoretical linguistics and to provide graduates with necessary theoretical skills for understanding and exploring the close relationship between linguistics and related disciplines.

The core requirement for the program includes two upper-level syntax courses (e.g., Syntactic Theory and either Advanced Syntactic Theory or Advanced Syntactic Analysis) and two upper-level phonology courses (e.g., Phonological Theory and Advanced Phonological Theory), and at least two seminars, for a total of 118 semester hours. An approved 18-hour specialty area is also required, and students must achieve proficiency in two tool areas, at least one of which is a foreign language.

Comprehensive examinations cover phonological theory, syntactic theory, theory of language change (historical linguistics and sociolinguistics), and the specialty area. An oral defense of the dissertation and three years of residence are also required. In addition, all candidates are required to gain supervised experience in teaching and research.

Special Facilities

The Department of Linguistics has an acoustics laboratory, consisting of a sound spectrograph, a studio-type tape recorder and an audiometric chamber. There is also a remote typewriter terminal connected with the IBM 360/65 computer at the University Computer Center.

The departmental reading room functions to allow a close relationship between faculty and students, a considerable influence of students upon departmental affairs, and a high degree of individual instruction. A large part of the student's education in linguistics is conducted informally through daily conversations among students and faculty members. Students and faculty members also meet monthly in an informal colloquium to discuss research in which students and staff are engaged.

The Department also has a practicum laboratory to provide experience in teaching English as a foreign language.

Departmental Financial Aids

Teaching assistantships and research assistantships are available to qualified graduate students. Application should be made by March 1 for the following academic year. Students applying for financial aid and admission concurrently should submit their GRE scores.

Courses

Special English courses for foreign students: 103:10, 103:191-197.

Primarily for Undergraduates

103:10 English for Foreign Students arr.
Training in spoken and written English for nonnative speakers of English. Permission of department.

103:11 Language and Society 4 s.h.
Correlations between social and linguistic behavior; methods for discovering and describing socially significant language behavior; educational and political implications of findings. Social Science core course.

103:20 Elements of Linguistics 3 s.h.
Basic introductory course for majors; generative hypotheses concerning nature of syntax, phonology, and semantics; nature of language history; relations of linguistics to education, psychology, sociology, anthropology. Same as 8L:20, 122:60.

103:21 Basic Phonetics 3 s.h.
Acquisition of basic skills in hearing, pronouncing and transcribing natural speech sounds; introduction to acoustic theory. Co- or prerequisite: 103:20.

103:22 Elements of Phonology 3 s.h.
The nature of speech sounds; phonemic principle, distinctive feature theory; types and ordering relations of phonological rules. Exercises. Prerequisite: 103:21 or equivalent.

103:23 Elements of Syntax 3 s.h.
Relating sounds and meanings; recursive devices as models of linguistic competence; phrase structure grammars; types and ordering relations of syntactic rules; problems from a variety of languages. Prerequisite: 103:20 or equivalent.

103:24 Methods in Linguistics 3 s.h.
Basic skills for the working linguist: desk, laboratory, and library problems; scope and accuracy of analysis; observational difficulties and experimental design. Prerequisites: 103:22 and 103:23.

103:25 Practicum Seminar 3 s.h.
Each student selects one or more extended problems for in-depth study. Sessions are structured to give mutual input; review of work undertaken for major. Prerequisite: 103:24.

103:99 Special Project arr.
Independent research on a linguistic topic directed by member of staff.

For Undergraduates and Graduates

103:100 Introduction to Linguistics 3 s.h.
Variety of topics in general linguistics. Same as 8L:100 and 122:101.

103:101 Introduction to Language and Communication 3 s.h.
Methods and research in area of intersection between linguistics and communication theory.

103:105 Language, Society and Education 3 s.h.
Socially conditioned attitudes to language use; development of prescriptivism, linguistic indicators of socioeconomic status, concept of a "standard" language and dialects of a language. Same as 8L:159.

103:106 Teaching English as a Foreign Language 3 s.h.
Domains of contrastive analysis; teaching foreign language skills. Survey of ESL texts; adapting and planning lessons; testing. Prerequisites: 103:150, 103:110, 103:173. Corequisite: 103:141.

103:107 Practicum in Teaching English as a Foreign Language 3 s.h.
Practical experience in teaching English as a second language under supervision. Prerequisite: 103:106.

103:110 Articulatory and Acoustic Phonetics 3 s.h.
Articulatory and acoustic phonetic theory; intensive practice in phonetic transcription.

103:111 Syntactic Analysis 3 s.h.
Problem-oriented introduction to simple generative models dealing with a wide range of syntactic problems in natural languages. Prerequisite: 103:150.

103:112 Phonological Analysis 3 s.h.
Solution of problems in phonological analysis in the framework of generative theory. Prerequisites: 103:150, 103:110.

103:113 Linguistic Field Methods 3 s.h.
Gathering and collation of language data in field; theory and practical problems; extensive practice in eliciting data from an informant. Prerequisite: 103:110-112.

103:114 Language Data Processing 3 s.h.
Introduction to computer use; interactive text editing, use of existing programs; computable vs. noncomputable language analyses. Same as 8L:114.

103:115 Language Data Programming 3 s.h.
Explicit conceptualization of language analysis procedures; program construction. Same as 8L:115.

103:120 Historical and Comparative Linguistics 3 s.h.
Principles of linguistic change; comparative method and genetic classification of languages; internal reconstruction and language typology. Prerequisite: 103:100 or equivalent. Same as 8L:120.

103:121 Syntactic Theory 3 s.h.
Detailed examination of the nature of linguistic argumentation; critical and creative research. Prerequisite: 103:111.

103:122 Phonological Theory 3 s.h.
Basic issues in generative phonological theory. Prerequisite: 103:112.

103:125 Introduction to Bilingualism 2-3 s.h.
Same as 35:125.

103:129 Introduction to Romance Linguistics 2-3 s.h.
Comparative study of Romance languages. Same as 35:129.

103:131 History of the English Language 3 s.h.
Development of phonological and grammatical structure of English from Old to Modern English; dialectal differentiation in English. Prerequisite: 103:100 or equivalent. Same as 8L:131.

103:132 Elementary Old English 3-4 s.h.
Structure of Old English; its historical position in the Germanic group of languages; reading of selected texts. Same as 8L:132.

103:133 Applied Linguistics 1-3 s.h.
Same as 35:133.

103:138 Structure of Japanese 3 s.h.
Linguistic analysis of modern spoken and written Japanese.

103:139 History of the Chinese Language 3 s.h.
Same as 39:139.

103:141 The Structure of English 3 s.h.
Detailed analysis of the structure of English. Prerequisite: 103:150. Same as 8L:141.

103:142 Modern English Grammar 2-3 s.h.
Views of great traditional grammarians in relation to contemporary structural and transformational approaches to grammar of modern English. Same as 8L:142.

103:143 German Phonology 3 s.h.
Structure of sound system of German language; introduction to problems of German morphology and syntax; basic linguistics course. Same as 13:103.

103:144 Introduction to Chinese Linguistics 3 s.h.
No knowledge of Chinese required. Same as 39:138.

103:150 Proseminar in Linguistics 3 s.h.
Designed to provide beginning graduate students in linguistics and graduate students in other fields with an intensive introduction to linguistic theory and methods; concentration on phonology and syntax. Same as 36:150.

103:163 Philosophy of Language 3 s.h.
Selected topics in contemporary philosophy of language. Prerequisite: consent of instructor. Same as 26:163.

103:170 Language and Culture 3 s.h.
Language as a reflection of organization, variation, and change in culture and society. Prerequisites: 113:3 or 113:101 and 113:171, 103:20, or 103:100, or consent of instructor. Same as 113:172.

103:171 Anthropological Linguistics 3 s.h.
Structure of spoken languages, emphasizing the

techniques for collection and analyzing of linguistic data; the historical and geographical relationships among unwritten languages. Same as 113:171.

103:172 Psychology of Language I 3 s.h.
Presentations of theoretical and empirical investigations of linguistic behavior; behaviorist and rationalist models within context of formal linguistic structure and models of speech perception and production. Same as 3:117, 31:113.

103:173 Language Teaching and Linguistic Behavior 3 s.h.
Psycholinguistic theory and linguistically oriented methods of foreign language teaching in connection with child language, second-language learning, teaching a prestige dialect to speakers of "substandard" dialects.

103:174 Linguistic Anthropology 3 s.h.
Concentrated investigation of selected topics in the anthropological study of language (e.g., ethnographic semantics, sociolinguistics, writing systems, distribution of languages). Prerequisite: 103:171 or consent of instructor. Same as 113:174.

103:175 Language Development 3 s.h.
Survey of contemporary theories and research dealing with acquisition of language in children. Prerequisite: 3:117 or 103:100.

103:176 Psychology of Language II 3 s.h.
Alternative models of language acquisition; empirical data examined in context of theories of linguistic and cognitive development. Prerequisite: 103:172, 103:100, or consent of instructor. Same as 31:153, 3:118.

103:177 Neural Processes of Speech and Language 3 s.h.
Neuroanatomy and neurophysiology related to speech and language processes; theories and research concerning brain function, neuromuscular processes and neural maturation. Same as 3:116.

103:180 Language and Cognition 3 s.h.
Language processes as mental processes: conceptual and experimental approaches. Prerequisites: 103:150 or 103:111 and 103:112.

103:181 Linguistic Perspectives 3 s.h.
Introduction to linguistic theory and methodology; relation of linguistics to literary criticism. For nonmajors only. Same as 8L:181.

103:191 Pronunciation for Foreign Students 2 s.h.
Pronunciation problems diagnosed and exercises given to help students hear English sound differences and reproduce them more accurately. Permission of department.

103:192 Vocabulary Development for Foreign Students 2 s.h.
Work on increasing vocabulary: antonyms, synonyms, verbal analogies, nuances of meaning, idioms and definition by context; vocabulary recognition and recall. Prerequisite: permission of Department.

103:193 Listening Comprehension for Foreign Students 3 s.h.
Practice in listening with the aim of retaining and manipulating information, identifying main ideas and important details and abstracting relationships. Practice in note taking. Prerequisite: permission of department.

103:194 Grammar for Foreign Students 3 s.h.
Focus upon more difficult patterns of grammar which are problems to students. Attention paid to paraphase relations, implication of grammatical patterns, ambiguity. Prerequisite: permission of Department.

103:195 Conversation for Foreign Students 3 s.h.
Participation in small group discussion to share fields of study; presentation of lectures and demonstrations to gain practice in speaking. Prerequisite: permission of Department.

103:196 Reading for Foreign Students 4 s.h.
Increasing reading speed and comprehension through practice and exercises; identification of main ideas, supporting details, compositional organization and viewpoint. Prerequisite: permission of Department.

103:197 Writing for Foreign Students 4 s.h.
Practice in using common patterns of compositional organization to present and develop ideas; attention paid to individual writing difficulties. Prerequisite: permission of Department.

Primarily for Graduates

103:205 History of Linguistics 3 s.h.
Topics in history of linguistic theory.

103:210 Linguistic Structures 3 s.h.
Analysis of grammatical and/or phonological structure of selected language or language family; language(s) considered vary from year to year. May be repeated for credit, with change in language analyzed. Prerequisite: consent of instructor.

103:211 Advanced Phonological Theory 3 s.h.
Current issues in generative phonological theory, including comparison of competing phonological theories (e.g., natural generative phonology, natural phonology). Substantial research paper required. Prerequisite: 103:122.

103:212 Advanced Syntactic Theory 3 s.h.
Recent developments in syntax; analysis of the nature of linguistic data, argumentation, and assumptions. Prerequisite: 103:121.

103:213 Formalisms of Natural Languages 3 s.h.
Basic mathematics for the analysis of natural languages (set theory, predicate calculus, functions, proof construction); basic formalizations (string, phrase marker, transformation, grammar); inclusion relations among types of grammars.

103:214 Advanced Syntactic Analysis 3 s.h.
Independent research in syntax. Prerequisite: 103:111.

103:216 Sociolinguistics and Dialectology 3 s.h.
Theory and methodology of intralanguage variation; relationship between language variants and socioeconomic class, sex, ethnicity and geography. Prerequisite: 103:150.

103:217 Language Universals and Linguistic Typology 3 s.h.
Examination of proposed universal principles of linguistic structure; approaches to classification of languages on the basis of grammatical and phonological structure. Prerequisites: 103:100 or equivalent, and consent of instructor.

103:218 Experimental Psycholinguistics 3 s.h.
Detailed examination of theoretical and empirical issues in psycholinguistics; laboratory sessions provide familiarity with the paradigmatic research in psycholinguistics. Prerequisite 3:117 or consent of instructor. Same as 3:218, 31:219.

103:219 Field Methods in Ethnolinguistics 3-5 s.h.
Research methods in ethnolinguistics; emphasis on techniques of collecting field data, collation and analysis of data and research design. Prerequisite: consent of instructors.

103:220 Seminar: Anthropological Linguistics arr.
Same as 113:271.

103:222 Language Acquisition 3 s.h.
Current theory and data on children's acquisition of language. Same as 31:253, 3:216.

103:231 History of the German Language 3 s.h.
Development of German language and dialects from prehistoric times to present. Same as 13:241.

103:232 History of the Scandinavian Languages 3 s.h.
Scandinavian languages from earliest times to present; readings in linguistic texts in Danish, Swedish and Norwegian. Prerequisite: one Old Germanic language. Same as 13:249.

103:240 Middle English Language and Literature 3 s.h.
Same as 8L:214.

103:245 Early Modern English Language and Literature 3 s.h.
Same as 8:213.

103:251 Old Norse 3-4 s.h.
Old Icelandic; some consideration of Old Danish, Old Swedish, Old Norwegian; reading of selected texts. Same as 8L:198.

103:252 Middle High German 3 s.h.
Grammar of High German literary language from 11th to 14th centuries; selected readings from literature of period. Same as 13:243.

103:253 Old High German 3 s.h.
High German dialects in earliest recorded forms; cultural, political, social influences exerted upon them from within and without the German-speaking area (8th to 11th centuries); readings from literature of period. Same as 13:245.

103:255 Gothic 3 s.h.
Gothic of Ulfilas and historical development of Germanic languages; introduction to comparative Indo-European linguistics. Same as 13:247.

103:260 Historical Ibero-Romance Language I 2-3 s.h.
Same as 35:253.

103:261 Historical Ibero-Romance Language II 2-3 s.h.
Same as 35:254.

103:262 Comparative Romance Linguistics 3 s.h.
Same as 20:201, 35:250, 9:250.

103:272 Learning Memory and Cognition 3 s.h.
Fundamental variables affecting acquisition, transfer, retention of verbal behavior, including role of language structure and language habits. Same as 31:225.

103:275 General Experimental Phonetics 5 s.h.
Summarizes current information and theory concerning acoustical, physiological, and perceptual characteristics of speech; emphasis on research techniques. Prerequisites: 3:112 and 3:120, or consent of instructor. Same as 3:250.

103:277 Physiology of Speech Production 5 s.h.
Summarizes current information and theory on physiological bases of speech production; emphasis on research techniques including supervised laboratory projects. Prerequisites: 3:112 and 3:120; or consent of instructor. Same as 3:252.

103:312 Seminar: Problems in Linguistics 3 s.h.
Intensive study of selected theoretical and practical problems.

103:320 Seminar: Psycholinguistics 2 s.h.
Topics vary: cerebral dominance, perceptual processing and language; discourse theory; pragmatics-conversational competence; cognitive models of language. Prerequisite: consent of instructor. Same as 3:533, 31:352.

103:321 Seminar: Language Development 2 s.h.
Topics vary: development of pragmatic competence in children, relation of general cognitive development and the acquisition of language. Prerequisite: consent of instructor. Same as 3:534, 31:314.

103:370 Seminar: Experimental Phonetics 2 s.h.
May be repeated for credit. Prerequisite: consent of instructor. Same as 3:532.

103:375 Seminar: Language Variables 2-4 s.h.
Same as 36:630.

103:387 Problems I english Linguistics 3 s.h.
Directed research in structure and/or history of English language. May be repeated, with different research areas, for credit.

103:390 Special Projects arr.

103:400 Master's Thesis 3 s.h.

103:450 Ph.D. Thesis arr.

Literature, Science and the Arts

Program chair: Donald G. Marshall
Faculty: *professors* Lane Davis (Political Science), John S. Harlow (Business Administration), Richard B. Hervig (Music), James O. Osburn (Chemical and Materials Engineering), Robert Scharlemann (Religion), John A.A. ter Haar (German), Richard J. Wilmeth (Sociology)
associate professors Richard J. Bloesch (Music), William E. Duffy (Education), William H. Klink (Physics and Astronomy), Donald G. Marshall (English), George Nickelsburg (Religion)
assistant professors Evan Fales (Philosophy), Judith P. Aiken (German)
Degree offered: B.A.

Courses in the Interdisciplinary Program in Literature, Science and the Arts (LSA) are open to junior, senior, and graduate students from any department. Courses are conducted by round-table discussion. Important issues of contemporary times are explored and evaluated, based on a reading list of outstanding works. Two or more instructors from various departments, such as literature, philosophy, history, fine arts and the sciences, guide the discussions.

Undergraduate Major

A major in the Interdisciplinary Program in Literature, Science and the Arts (LSA) offers a basis for a liberal education and equips a student for further work in the special area of his or her choice. The major is set up to provide broader training than is ordinarily obtained under the specialized requirements of a single department.

A student can major in this area and earn teacher certification in one or more related departments, or satisfy the requirement for a double major in this program and another.

These specific requirements for the major in the Interdisciplinary Program in Literature, Science, and the Arts (LSA) are in addition to the general requirements of the College of Liberal Arts:

LSA	12 s.h.
Natural, social sciences	12 s.h.
Philosophy, religion, history	12 s.h.
Literature beyond core requirements	12 s.h.
Fine arts (excluding studio courses)	3 s.h.
Foreign language: one semester beyond second year (foreign literature courses in the original language may also be used to satisfy the requirement in literature)	3 s.h.

Students considering a major in the Interdisciplinary Program in Literature, Science and the Arts (LSA) should consult with the chair before the end of the sophomore year.

Honors

Superior students who undertake a further program of independent study may earn the Bachelor of Arts degree "with honors." To be admitted as a candidate for Honors, the student must have the endorsement of the chair of the Interdisciplinary Program in Literature, Science and the Arts.

Courses

33:101 The Pursuit of Happiness 2-4 s.h.
Treatment of individual happiness in various types of human experience by Aristotle, Freud, Cellini, Montaigne, Voltaire, Boswell, Sartre, etc.

33:102 Love in the Western World 2-4 s.h.
Meaning, importance, and varieties of love as they appear in literature, music, art, philosophy, psychology, and religion.

33:111 Myth and Reason 2-4 s.h.
Interplay between myth and reason as significant patterns in Western thought; reading from Sophocles, Plato, Milton, Nietzsche, anthropologists, novelists.

33:121 The Good Society 2-4 s.h.
Man's life in society and its potentialities as seen in works by Plato, Rabelais, Machiavelli, Shakespeare, Locke, Gibbon, Marx; recent fiction and nonfiction.

33:152 Values in the Contemporary World 2-4 s.h.
Modern problems in definition and choice of values, examined through writings of contemporary ethical theorists and novelists.

33:153 Heretical Books: Controversy in Contemporary Social Thought 2-4 s.h.

33:154 Human Nature and the Impact of Science 2-4 s.h.
Relationship of scientific to humanistic, social, and religious thought. Same as 13:154.

33:161 Form and Milieu in the Arts 2-4 s.h.
Interplay between art forms and other cultural patterns, institutions and rituals, through close examination of creative and theoretical writings, specific works of music and graphic art.

33:164 Roots of Modern Culture 2-4 s.h.
Literary and social manifestations of modern Romanticism.

33:170 Biblical Interpretation in Oratorio and Opera 3 s.h.
Same as 25:213, 32:171.

33:173 Music as Drama 2-4 s.h.
Libretto and score as autonomous and interdependent elements in opera and other musical works with texts. Same as 13:173.

33:180 Special Projects arr.

33:191 Independent Study for Honors 2-4 s.h.
Honors candidates must take 33:191 and 33:192, for a total of six semester hours. Cannot be taken concurrently.

33:192 Independent Study for Honors 2-4 s.h.

Division of Mathematical Sciences

Degrees offered: B.A., B.S., M.S., Ph.D.

Undergraduate Program

The Division of Mathematical Sciences offers a flexible undergraduate program which may be largely tailored to the student's needs and interests. In particular, programs can be designed which will prepare the student for employment or advanced study in any area of the mathematical sciences.

The Bachelor of Arts Degree

In addition to at least one year of calculus (either 22M:25-26 Calculus I-II or 22M:35-36 Engineering Calculus I-II), the student must take at least seven additional courses, each carrying at least 3 s.h. credit. Except for students electing the applied mathematical sciences option, these seven courses must be from the Division, and (except for students seeking a secondary teaching certificate) must include either two of these:

22C:116 Operating System Principles
22C:122 Advanced Computer Organization and Architecture
22C:123 Programming Language Foundations
22C:135 Introduction to Computation Theory
22C:145 Artificial Intelligence I
22M:100 Introduction to Ordinary Differential Equations
22M:101 Introduction to Partial Differential Equations
22M:118 Complex Variables
22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory

22M:171 Numerical Analysis: Differential Equations and Linear Algebra

Or one of these combinations:

22M:103-104 Foundations of Mathematics I-II
22M:110-111 Elementary Topology I-II
22M:115-116 Introduction to Analysis I-II
22M:120-121 Abstract Algebra I-II
22M:130-131 Theoretical Mechanics I-II

22S:153 Introduction to Probability
and
22S:167 Introduction to Stochastic Processes
or
22S:154 Introduction to Mathematical Statistics I

22S:180-181 Actuarial Theory I-II

The following do not count toward the seven required courses:

22C:1 Survey of Computing
22C:9 Programming with COBOL
22C:100 Introduction to Computing with FORTRAN
22C:106 Introduction to Programming with PL/1
22C:107 Programming with PL/1
22C:108 Assembly Language Programming
22C:109 Programming with COBOL
22C:110 Computing with PL/1
22M:1 Basic Mathematical Techniques
22M:2-3 Mathematical Techniques I-II
22M:4 Matrix Algebra
22M:7 Quantitative Methods I
22M:10-11 Fundamentals of College Mathematics I-II
22M:15 Mathematics for the Biological Sciences
22M:16 Calculus for the Biological Sciences
22M:20 Elementary Functions
22M:25-26 Calculus I-II
22M:29 Computation Laboratory for Calculus and Linear Algebra
22M:35-36 Engineering Calculus I-II
22M:80 Theory of Arithmetic
22M:81 Geometry for Elementary Teachers
22S:8 Quantitative Methods II
22S:25 Elementary Probability and Statistics
22S:102 Introduction to Statistical Methods

Students who complete the requirements for a secondary teaching certificate may take any two 100-level courses among their seven courses in mathematics.

The Bachelor of Science Degree

In addition to the requirements outlined above for the Bachelor of Arts degree, the Bachelor of Science degree requires two one-semester courses from the Division, each carrying at least 2 s.h. of credit.

Transfer Students

Transfer students must earn at least 9 s.h. of credit in the Division beyond the first year of calculus or beyond the first course in computer science (22C:16).

Applied Mathematical Sciences Option

The applied mathematical sciences option is designed to reflect the increasing diversification of applications of mathematics and statistics to the social sciences, biological and physical sciences, management, business, ecology, linguistics, and engineering.

For this option, the seven courses taken in addition to the first year of calculus must include:

- One semester of linear algebra (either 22M:27 Introduction to Linear Algebra or 22M:38 Differential Equations and Linear Algebra);
- At least three courses from the Division numbered 22M:50 or above (excluding 22M:80-81) or 22S:103 or above, at least one of which must be at or above the 100-level; and
- At least three additional quantitative courses from any one department outside of the Division. At the discretion of the adviser, courses from two closely related departments might be used.

Students electing this interdisciplinary option will be appointed to a specially designated program adviser with whom they can work out an acceptable program. Such a program must include some concentration in a particular area. Some experience with the use of the computer is also required.

Suggested Programs

Some typical programs in various areas are listed below. They need not be followed exactly; rather, it is expected that each student will meet with his or her adviser and work out a program which reflects his or her mathematical interests. The requirements are flexible enough to allow for changes in students' interests.

A student who is majoring in mathematics and who is interested in earning a Master of Business Administration (M.B.A.) with only one year of graduate study should take appropriate business courses as an undergraduate. To do this successfully, the student should consult with the associate dean of the College of Business Administration, as well as his or her adviser, before the senior year.

General Program

Unless a student has a strong interest in a special area in mathematics, a rather general program is suggested. This type of program should include 22C:7 Introduction to Computing with FORTRAN, preferably along with calculus during the freshman year. The program should also include a course such as 22M:50 Elements of Group Theory, 22M:55 Fundamental Properties of Spaces and Functions, or 22M:103 Foundations of Mathematics I, and it should include at least a semester's work in statistics and probability.

Additional work, in particular the required 100-level course, should be taken in whatever area of mathematical sciences is of most interest to the student. Students contemplating employment in government or industry upon completion of the B.A.or B.S. degree should consider 22C:17 Programming with PL/1 and courses in numerical analysis, actuarial science, applied statistics and operations research.

Actuarial Science

The student who plans to enter the actuarial profession should be guided in course selection by the program of education and examinations carried on by the principal actuarial organizations. Following a sequence in calculus and linear algebra (22M:25-26 Calculus I-II, 22M:28 Calculus III, and 22M:27 Introduction to Linear Algebra or 22M:35-37 Engineering Calculus I-III and 22M:38 Differential Equations and

Linear Algebra), the student should take 22S:153 Introduction to Probability, 22S:154 Introduction to Mathematical Statistics I, 22S:180-182 Actuarial Theory I-III and 22S:177 Numerical Analysis for Actuaries. Additional courses of direct professional interest to actuaries include 22S:178 Graduation, 22S:183 Demography and Life Table Construction, 22S:184 Risk Theory and 22S:185 Theory of Pension Funding.

Students are encouraged to take at least one course in computer science and a substantial program of courses from the College of Business Administration. Should it not be possible to complete such a program as an undergraduate, a year of graduate work may be advisable.

Applied Mathematics

All students interested in applied mathematics should take the sequence 22M:25-26 Calculus I-II, 22M:28 Calculus III, and 22M:27 Introduction to Linear Algebra or the sequence 22M:35-37 Engineering Calculus I-III and 22M:38 Differential Equations and Linear Algebra.

The courses 22M:100 Introduction to Ordinary Differential Equations, 22M:101 Introduction to Partial Differential Equations, 22M:118 Complex Variables, 22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory, and 22M:171 Numerical Analysis: Differential Equations and Linear Algebra, are recommended. Additional courses directly concerned with applications of mathematics are 22M:130-131 Theoretical Mechanics I-II, 22M:172 Methods of Solutions of Boundary Value Problems, 22M:173 Transform Calculus, and 22M:180-181 Topics in Applied Analysis I-II.

Other general courses which may be of interest are 22M:50 Elements of Group Theory, 22M:105 Analysis for Applications, 22M:116 Introduction to Analysis II, 22M:126 Elementary Theory of Numbers and 22M:150 Matrix Theory.

Students in applied mathematics should be familiar with computer programming (22C:7 Introduction to Computing with FORTRAN can be taken early along with calculus) and with the basic ideas of probability and statistics (the courses 22S:153 Introduction to Probability and 22S:154 Introduction to Mathematical Statistics I or 22S:120 Probability and Statistics are appropriate).

To acquire an understanding of how mathematics is used in other areas, it is recommended that the student take a set of courses, involving mathematics in a significant way, outside the Division of Mathematical Sciences. Students who plan to do graduate work in applied mathematics should take 22M:115 Introduction to Analysis I.

Mathematics Education

For general requirements for teacher education, see "College of Education."

Mathematics courses required for students in mathematics education are 22M:25-26 Calculus I-II, 22M:27 Introduction to Linear Algebra, 22M:50 Elements of Group Theory, 22M:70 Euclidean Plane Geometry, and 22M:55 Fundamental Properties of Spaces and Functions (to be taken before 7S:135 Methods Mathematics). A 100-level course in the same area of mathematics may be substituted for any one or more of these. Students are also required to have proficiency in one computer programming language. In the 100-level courses, the student should strive for breadth. It is recommended that the student select at least one of these courses in the Department of Statistics. The student might select from these 100-level courses: 22M:120-121 Abstract Algebra I-II, 22M:115-116 Introduction to Analysis I-II, 22M:103-104 Foundations of Mathematics I-II, 22M:110-111 Elementary Topology I-II, 22S:120 Probability and Statistics, 22S:153 Introduction to Probability, and 22S:154 Introduction to Mathematical Statistics I.

Pure Mathematics

Students interested in this area of mathematics should take two of these sequences: 22M:120-121 Abstract Algebra I-II, 22M:115-116 Introduction to Analysis I-II, 22M:103-104 Foundations of Mathematics I-II and 22M:110-111 Elementary Topology I-II; and at least two semesters of coursework outside this area, e.g., 22C:7 Introduction to Computing with FORTRAN, 22C:17 Programming with PL/1, 22M:100 Introduction to Ordinary Differential Equations, 22M:118 Complex Variables, 22S:153 Introduction to Probability, or 22S:154 Introduction to Mathematical Statistics I.

Probability and Statistics

The basis for this program is the calculus sequence 22M:25-26 Calculus I-II, 22M:28 Calculus III, and 22M:27 Introduction to Linear Algebra or 22M:35-37 Engineering Calculus I-III and 22M:38 Differential Equations and Linear Algebra together with one of these three sequences: 22S:153 Introduction to Probability and 22S:154 Introduction to Mathematical Statistics I; 22S:153 Introduction to Probability and 22S:167 Introduction to Stochastic Processes; or 22S:120 Probability and Statistics and 22S:158 Analysis and Design of Experiments or 22S:162 Regression Analysis.

Students should also select one or two courses in computer science from 22C:7 Introduction to Computing with FORTRAN, 22C:17 Programming with PL/1, or 22C:18 Assembly Language Programming; and one or two courses in mathematical analysis from 22M:55 Fundamental Properties of Spaces and Functions, 22M:105 Analysis for Applications and 22M:115 Introduction to Analysis I. Substantial work in one of the biological, social, physical or engineering sciences is also highly recommended.

Further courses in probability and statistics may be selected from courses in the Department of Statistics numbered 100 and above excluding 22S:102 and 22S:125. Additional courses may be selected from 22M:50 Elements of Group Theory, 22M:110 Elementary Topology I, 22M:116 Introduction to Analysis II, 22M:118 Complex Variables, 22M:150 Matrix Theory, 22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory, 586:141 Introduction to Operations Research and 586:149 Digital Systems Simulation I.

Applied Mathematical Science

Committee cochairs: William H. Klink, Karl E. Lonngren, Paul E. Waltman
Degree offered: Ph.D.

Creative activities of an applied mathematical scientist include the formulation of scientific concepts and problems in mathematical terms; the solution of the resultant mathematical problems; the discussion, interpretation, and evaluation of the results of the analysis; the exploration of new ideas and areas of application; and the development of mathematical theories in areas which have not hitherto been subjected to systematic mathematical treatment. These efforts may, in turn, lead to the generation of new mathematical ideas

and theories as a result of abstraction or generalization.

Opportunities for careers include faculty positions in colleges and universities, research positions in industrial and government laboratories, professional consulting positions and software computer consulting. The mathematical modeling learned by the student is useful in a wide variety of situations in this technological world.

Applied Mathematical Science at Iowa is an autonomous, broadly-based interdisciplinary program leading to the Doctor of Philosophy degree. The program seeks to help the student achieve a basic command of advanced mathematics, at least one science (behavioral, biological, engineering, physical or medical), and the methods of applied mathematics. Additionally, the program seeks to develop the "attitude" of an applied mathematical scientist by emphasizing the totality of the discipline.

Each student will have a committee of three or more faculty members to guide and carefully supervise his or her program. The individual plan of study will be specifically developed by incorporating the desired balance in the appropriate science, advanced mathematics and applied mathematical science with the student's background, interests and goals.

A major objective of the program is to have the development of each student's dissertation follow the full cycle of research in applied mathematical science. Guided by the supervising committee, each student is expected to recognize a significant problem within his or her science. Then he or she develops an appropriate mathematical model for that problem, critically examines that model with respect to its tractability and success in prediction, and develops improvements if necessary.

Students may enter with either a bachelor's or a master's degree. Applicants are expected to have an excellent background in science and mathematics, together with a desire to apply mathematics to the solution of relevant scientific questions. All applicants must satisfy the general requirements of the Graduate College.

Fellowships, graduate tuition scholarships and some research and teaching assistantships are available to qualified applicants. Applications for these appointments must be received before March 1. For application forms and further information about the academic program, write to the Chairman, Program in Applied Mathematical Science, Graduate College, The University of Iowa, Iowa City, Iowa 52242.

Computer Science

Department chair: Ted J. Sjoerdsma
Faculty: *professors* Donald L. Epley, Arthur C. Fleck, Amar Mukhopadhyay
associate professors Donald A. Alton, Theodore P. Baker, Robert J. Baron, Ted J. Sjoerdsma
assistant professor Chung-shu Yang
instructor Frederick R. Keller
Degrees offered: B.A., B.S., M.S., Ph.D.

Undergraduate Program

Undergraduates majoring in computer science should gain a strong background in mathematics and in programming languages and computer systems. To accomplish this, the following core courses are required for a B.A. degree in computer science:

Mathematics Requirements

22M:25 Calculus I	4 s.h.
22M:26 Calculus II	4 s.h.
and	
22M:27 Introduction to Linear Algebra	4 s.h.

Computer Science Core Requirements

22C:16 Introduction to Programming with PL/1	3 s.h.
22C:17 Programming with PL/1	3 s.h.
22C:18 Assembly Language Programming	3 s.h.
22C:21 Data Structures	3 s.h.
22C:23 Programming Language Concepts	3 s.h.
22C:31 Introduction to Systems Hardware	3 s.h.
22C:32 Introduction to Systems Software	3 s.h.
and	
22C:50 Discrete Structures	3 s.h.
or	
22C:55 Elementary Numerical Analysis	3 s.h.
Total	36 s.h.

All students are urged to take both 22C:50 and 22C:55. Students who plan to go on to graduate work are especially urged to take 22C:50 and either 22C:55 or 22M:170.

To receive a B.S. degree, the student must take two additional courses (each having at least 2 s.h. credit) in the Division of Mathematical Sciences. In addition, the student pursuing this major for either a B.A. or B.S. must complete an approved elective program. The *Handbook for Computer Science Undergraduates*, available at the Mathematical Sciences Division Office, includes suggested elective programs, information concerning credit by examination for the computer science core requirements and other information. The student's adviser maintains an academic record sheet (discussed in the *Handbook*) concerning the approved elective program.

Graduate Programs

To provide the broadest possible background for its students and to take advantage of courses offered in other fields, the normal curriculum in computer science includes work in several related fields. Within limits, an advanced degree program in computer science can be constructed to serve the particular needs of a student. However, a certain core of courses should generally be taken by any candidate for an advanced degree in this field.

If a student is concerned about a specific subject area in which computer science is a necessary but not a major part of his or her goal, then the student may be better served by earning a degree in that other area with a heavy concentration of courses in computer science. For instance, the Computer Science Department cooperates with the Program in Applied Mathematical Science in developing interdisciplinary doctoral programs.

Although the plan of study of each advanced degree student is individually arranged to fit his or her needs, each student will be expected to study in the areas of programming, computer systems and computation theory. The requirements for the M.S. and Ph.D. degrees are outlined below, and specific details including grade-point requirements, comprehensive examination information, student review policies, and complete course descriptions are given in the departmental *Graduate Student's Handbook*, which is available at the Mathematical Sciences Division Office.

The M.S. graduates will find careers as programmers or systems analysts in industry, business or government, as well as in directing and teaching computing in four-

year colleges. The Ph.D. student can find the same opportunities and in addition can find a career in research and teaching at the advanced level.

Master of Science

Adviser and student will draw up a plan of study which will ensure that the student achieves proficiency equivalent to that which can be gained by taking the following courses:

22C:122 Advanced Computer Organization and Architecture	3 s.h.
22C:123 Programming Language Foundations	3 s.h.
22C:135 Introduction to Computation Theory	3 s.h.
Other 22C courses selected from 116, 118, 127, 144, 145, 178, or any 200-level course	6 s.h.
Mathematics and statistics courses	6 s.h.
Additional courses selected by the student with the approval of the adviser	9 s.h.
Total	30 s.h.

Recommended mathematics, statistics, and additional courses depend upon the student's career objectives.

The student who intends to pursue applied computer science might profitably elect courses from: 22M:150 Matrix Theory, 22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory, 22M:171 Numerical Analysis: Differential Equations and Linear Algebra, 22S:153 Introduction to Probability, 22S:154 Introduction to Mathematical Statistics I, 22S:158 Analysis and Design of Experiments and courses in business administration or industrial engineering.

The student who intends to seek a Ph.D. degree might well select optional courses from: 22M:205 Introduction to Algebra I, 22M:210 Analysis I, and 22S:253 Theory of Statistics I.

Any M.S. candidate may elect to write a thesis, and with the adviser's consent may apply up to six semester hours of thesis credit toward the total required for the M.S. degree. The minimum number of semester hours for the M.S. degree in computer science with or without thesis is 30.

Final Examination

The candidate for the M.S. degree must successfully complete one of the examinations listed below. Each is a three-hour written examination, except the thesis defense, which is oral.

Programming and Programming Languages
Computer Systems and Hardware
Computation and Automata Theory
A thesis defense

Student should consult the *Graduate Student's Handbook* for further information.

Admission

The student seeking admission to the M.S. program in Computer Science is subject to the general admission requirements of the Graduate College (see "Graduate College"). It is strongly recommended that the applicant have a B.A. or B.S. in computer science, mathematics, engineering or physical science. A student whose undergraduate program does not include equivalents of the courses required in the Computer Science undergraduate curriculum will be expected to complete these courses prior to admission to graduate courses, for which they are prerequisite.

Doctor of Philosophy

Course Requirements

Doctoral students are expected to complete about 90 semester hours of graduate work, including a thesis. The student need not have a master's degree when beginning the Ph.D. program, and need not acquire one. Usually, however, the Ph.D. student acquires a master's degree either in computer science or in some other mathematical or physical science. Every Ph.D. student in computer science is expected to be knowledgeable in the following four categories:

- Programming concepts, including programming, programming languages, design of algorithms, simulation, artificial intelligence, and numerical analysis;
- Theory of computation, including automata theory, computability and formal languages, and analysis of algorithms;
- Mathematical foundations, including set theory, algebra, analysis, logic, and graph theory; and
- Computer systems, including operating systems, computer architecture, and logical design and database systems.

Although the plan of study for each student will be drawn up by the student and his or her committee to fit any special needs, every student is expected to complete approximately half of the coursework in the first two categories above.

The student must complete three courses with grades of A or B, at least one of which is at the 200 level, in each of two areas. One area must be selected from:

Algebra
Analysis
Logic and set theory
Satistics and probability
Numerical analysis

The second area may be selected from the above, or from:

Electrical engineering
Operations Research
Business administration
Linguistics
Other related areas as approved by the department

If the student selects statistics and probability as one of the areas, the advanced course may be chosen at the 100 level.

Comprehensive Examination

A student is admitted to candidacy for the Ph.D. degree in computer science only after completing the comprehensive examination. In addition, he or she must be recommended by a member of the computer science faculty. The comprehensive examination will normally be taken only when the student nears completion of coursework as required by the plan of study. There are three three-hour written examinations, which may be followed by an oral review:

- Part I: On all aspects of programming and programming languages;
- Part II: On the principles of computer architecture and operating systems; and
- Part III: On the theoretical aspects of computer science, including automata theory, computability and formal languages.

All examinations are described in the *Graduate Student's Handbook*.

Thesis

After demonstrating competency in each of the three required areas of computer science and maintaining the required GPA, the student will prepare a written research proposal which will be defended in an oral

examination administered by the student's committee. The student must demonstrate expertise in the area of the proposed research and must also justify the originality and significance of the proposed contribution. An oral defense of the thesis is required.

Admission

The department has a highly selective admissions policy and normally considers only students with a grade-point average above 3.3.

Graduate Service Courses

Competence and experience in the use of a digital computer in problem solving is useful and often prerequisite to advanced study and research in many disciplines. For most students, the two-semester sequence 22C:106 Introduction to Programming with PI/1 and 22C:107 Programming with PL/1 is recommended. Students in fields in which other programming languages are heavily used may find 22C:100 Introduction to Computing with FORTRAN, 22C:108 Assembly Language Programming or 22C:109 Programming with COBOL more appropriate. The one-semester PL/1 course 22C:110 Computing with PL/1 is recommended only for students with considerable programming experience using other languages.

Courses

Primarily for Undergraduates

22C:000 Cooperative Education Training Assignment 0 s.h.

22C:1 Survey of Computing 3 s.h.
The nature, uses, and limitations of computers and computing as observed by a broad sample of computing techniques including batch and interactive computing, packaged programs, non numeric programming, computer-assisted instruction, information retrieval, field trips to representative computer installations, impact of computing technology on society. No prerequisites.

22C:7 Introduction to Computing with FORTRAN 3 s.h.
Basic concepts of computer structure and programming techniques, elementary assembler-language programming, algorithms, data representations, subprograms, tape and disk usage; major emphasis on programming with FORTRAN. No prerequisites.

22C:9 Programming with COBOL 3 s.h.
Use of the business-oriented language COBOL; records, files, and mass storage devices; programming techniques for table handling, sorting, generation of reports from files, and maintenance of sequential and random-access files. Prerequisite: programming experience.

22C:16 Introduction to Programming with PL/1 3 s.h.
Programming and program design techniques using portions of the PL/1 programming language; forms a coordinated two-semester sequence with 22C:17; variables, expressions, structured control constructs, internal arithmetic representations and character data; input-output; arrays and structures; external procedures. No prerequisites.

22C:17 Programming with PL/1 3 s.h.
Continuation of 22C:16; block structure, name scope, memory allocation and design of program structure using procedures; top-down programming; files and record input-output; programming project with large amount of data and use of files; structured testing and debugging; list processing and application of lists. Prerequisite: 22C:16.

22C:18 Assembly Language Programming 3 s.h.
Representation of data and conversion, CPU organization, addressing, relocatability and the use of base registers; interpretation of program listings and dumps; indexing, looping, and branching; subroutines and linkage conventions; input-output through operating systems; macros; decimal arithmetic. Prerequisite: 22C:16 or 22C:7.

22C:21 Data Structures 3 s.h.
Arrays, pushdown stores, lists and list structures; files and file sorting and searching techniques; dynamic storage allocation and garbage collection algorithms; programming for list and string processing; recursive list processing techniques; presentation will use PASCAL, PL/1, and an algorithmic language. Prerequisite: 22C:23.

22C:23 Programming Language Concepts 3 s.h.
Syntax of programming languages; programming language structures (blocks, functions, procedures, subroutines); data types, declarations, and data structure facilities; control structures; operators and operations including pattern matching; extensibility; structured programming; recursive programming; examples from ALGOL W, SNOBOL, PL/1, and LISP. Prerequisite: 22C:17.

22C:31 Introduction to Systems Hardware 3 s.h.
Basic hardware components: gates, flip-flops, decoders, multiplexers, registers; register operation; arithmetic, logical units and algorithms; memory systems; secondary devices; addressing and instruction types; conventional and microprogrammed control units; I/O organizations: direct memory access, I/O interrupt, I/O architectures; case studies of a minicomputer and a microcomputer. Prerequisite: 22C:18.

22C:32 Introduction to Systems Software 3 s.h.
Introduction to systems programming concepts; assemblers and compilers; loaders and linkage editors; operating system services; I/O channel design; microprogramming.

22C:50 Discrete Structures 3 s.h.
Sets, relations, functions, equivalence and congruence relations, induction and cardinality; permutations and combinations; algebraic structures, semigroups, groups, homomorphisms; switching theory, Boolean algebra, propositional logic, well-formed formulas, disjunctive normal forms; graph theory, graphs, and matrices. Prerequisite: 22M:26 or 22M:27.

22C:55 Elementary Numerical Analysis 3 s.h.
Numerical solution of polynomials and general algebraic equations; numerical solution of simultaneous linear equations and matrix operations; least squares curve-fitting techniques; interpolation polynomials; numerical solution of ordinary differential equations; detailed error analysis of several of the techniques studied; illustrative programming projects. Prerequisites: 22M:26 and programming experience. Same as 22M:72.

22C:96 Topics in Computer Science arr.
Reading, research, or programming projects in computer science not available in other courses; interested students may contact any faculty member concerning enrollment; students interested in major programming projects should enroll in 22C:193. Prerequisite: consent of instructor.

Graduate Service Courses

22C:100 Introduction to Computing with FORTRAN 3 s.h.
A programming course designed to provide the nonmajor with an application-oriented knowledge of FORTRAN; basic computer structure, data representation, input-output, arrays, character manipulation, subprograms, use of tape and disk storage; not open to Computer Science majors for degree credit.

22C:106 Introduction to Programming with PL/1 3 s.h.
Not open to undergraduates or computer science majors for degree credit.

22C:107 Programming with PL/1 3 s.h.
Not open to undergraduates or computer science majors for degree credit.

22C:108 Assembly Language Programming 3 s.h.
Not open to undergraduates or computer science majors for degree credit.

22C:109 Programming with COBOL 3 s.h.
Not open to undergraduates or computer science majors for degree credit.

22C:110 Computing with PL/1 3 s.h.
A programming course designed to provide the nonmajor with an application-oriented knowledge of PL/1; topics include elementary list processing, character manipulation, file techniques, structured programming, and an introduction to job control and flow in S/360; not open to computer science majors for degree credit. Prerequisite: 22C:100 or 22C:7.

22C:114 Computer Applications to Individualize Instruction 3 s.h.
Introduction to computer-assisted instruction (CAI); emphasis on author languages, instructional strategies, and development of individualized learning material including CAI course material. Not open to computer science majors for graduate degree credit. No prerequisites.

Courses Primarily for Computer Science Majors

22C:116 Operating System Principles 3 s.h.
Qualitative and descriptive treatment of operating system principles, including concurrent processes, name and file management, memory management, multiple resource management, dynamic protection, structure of operating systems. Prerequisite: 22C:31.

22C:118 Systems Programming Laboratory 3 s.h.
Projects in analysis, design, and implementation of systems software; emphasis on operating systems; file system and segmentation concept; implementation of advanced concepts such as sharing and dynamic protection; examination of system programming languages and other design aids. Prerequisite: 22C:116, and consent of instructor.

22C:122 Advanced Computer Organization and Architecture 3 s.h.
Review of classical organization principles; advanced hardware concepts: high-speed arithmetic units, microprogramming, emulation; virtual memory hardware; hardware for improved CPU utilization: cache stores, memory interleaving, instruction buffering, instruction and operand pipelining, data channels and peripheral processors; novel architectures; stack, pipelined, array, multicomputer and other types of organization principles. Prerequisite: 22C:31.

22C:123 Programming Language Foundations 3 s.h.
Review of program structure and parameter passage; formal specification of the syntax and semantics of programming languages; proofs of program correctness and termination; semantics of data structures; extensible languages; nondeterministic programming, advanced control structures, advanced data types. Prerequisite: 22C:23.

22C:127 Compiler Construction 3 s.h.
Compilation techniques: syntactic analysis; parsing algorithms; symbol tables; memory organization; construction of components of a compiler. Prerequisites: 22C:21 and 22C:23.

22C:135 Introduction to Computation Theory 3 s.h.
Sequential machines, machine equivalence and homomorphism; regular expressions and finite automata; hierarchy of formal languages, closure properties; finite-state, pushdown, linear-bounded, and Turing acceptors; relationships between formal languages and automata; undecidability of the halting problem and its consequences. Prerequisite: 22C:50.

22C:144 Design of Information Systems 3 s.h.
Design of file organizations; external sort; descriptions and manipulation; query languages; semantics and modeling; system architecture; security, integrity, concurrency, and recovery; survey of commercial systems. Prerequisite: 22C:21 or consent of instructor.

22C:145 Artificial Intelligence I 3 s.h.
Basic concepts of machine intelligence: problem-solving methods—state space representations, heuristic search, problem-reduction techniques; game-playing programs; question-answering systems; processing pictorial information; robotics. Prerequisite: 22C:21.

22C:153 Design and Analysis of Algorithms 3 s.h.
Problem-solving techniques which facilitate design of efficient, correct algorithms; analysis of algorithms behavior; examples. Prerequisites: 22C:23, 22C:50.

22C:178 Computer Communications 3 s.h.
Review of communication system components; digital communication systems—sampling theorems, channel errors, error-correcting and error-detecting codes, waveform distortion equalization, modems, multiplexing; computer communications—data structures, terminals, data concentrators; computer networks—capacity, routing, protocol, security; case studies. Prerequisite: senior standing. Same as 545:134.

22C:191 Research for Thesis arr.
For M.S. candidates in computer science. Prerequisite: consent of adviser.

22C:193 Programming Laboratory 2 s.h.
Structuring and integration of large computer programs; top-down programming methods; program documentation; summary and use of system facilities; students will develop and document substantial programs; open only to computer science seniors and graduate students with adequate programming experience.

22C:196 Topics in Computer Science 3 s.h.

22C:197 Readings in Computer Science arr.
Prerequisite: consent of instructor.

22C:198 Individual Programming Projects arr.
Supervised by faculty, offered by arrangement with individual students. May be repeated maximum of three times.

Courses Primarily for Graduates

22C:216 Advanced Operating Systems 3 s.h.
Analytical modeling and analysis in computer system design such as processor scheduling, I/O scheduling, memory management policies, program behavior and multiple resource allocation; performance measurement and analysis, and simulation of computer systems. Prerequisites: 22C:116, and course in probability and statistics.

22C:217 Topics in Programming Language and Compiler Theory 3 s.h.
Advanced topics in programming languages and compilers, including syntax-directed translation via context-free grammars and other formalisms, precedence grammars and parsing optimization; code generations; object code optimization; compiler-compilers; implementing recursion and nondeterminism. Prerequisites: 22C:123 and 22C:127.

22C:222 Advanced Switching Theory 3 s.h.
Advanced topics from cellular logic and iterative networks, universal logic modules, completeness and complexity of switching networks, fault diagnosis and reliable digital networks, threshold logic, classification of switching functions and asynchronous networks. Prerequisite: 22C:135 or 545:130. Same as 545:230.

22C:231 Advanced Theory of Computation 3 s.h.
Partial recursive, recursive, and primitive recursive functions, recursive and recursively enumerable sets; universal machines; noncomputability, results, the recursion theorem, complexity measures, speed-up, limited halting. Prerequisite: 22C:135.

22C:234 Topics in the Complexity of Algorithms 3 s.h.
Analysis of the complexity of specific algorithms from sorting, merging, graph-processing, and other areas; lower bounds on the complexity of arbitrary algorithms from sorting, merging, polynomial evaluation, matrix multiplication, and other areas; exponential lower bounds on resources. Prerequisite: 22C:135.

22C:244 Topics in Information System Design 3 s.h.
Advanced topics in logical database design; semantics and modeling; language interface; design and evaluation of organizations; system performance evaluations; security, integrity, concurrency, and recovery; reorganization; translation; hardware architectures; distributed systems.

22C:245 Artificial Intelligence II 3 s.h.
Advanced topics in machine intelligence including theorem proving, concept formation, AI programming languages and concepts, machine understanding, robot models, philosophies of machine intelligence. Prerequisite: 22C:145.

22C:247 Theory of Program Schemata 3 s.h.
Program schemata, equivalence, termination, freedom, and decision problems; recursive schemata; data structure modeling; parallel schemata; proving properties of program. Prerequisites: 22C:135 and 22C:123.

22C:257 Formal Languages 3 s.h.
Characterization, decision problems, closure properties and operations of phrase-structure, context-sensitive, context-free, and linear languages; finite automata, pushdown stack, linear-bounded, and Turing machine acceptors; abstract families of languages; label languages and control grammars. Prerequisite: 22C:135.

22C:295 Seminar on Artificial Intelligence arr.
Topics from concept-formation, pattern recognition, game playing, problem solving, theorem proving, question answering, robotics, and neural modeling. Prerequisite: consent of instructor.

22C:296 Seminar on Computer Science 3 s.h.
Recent advances in the field of computer science. Prerequisite: consent of instructor.

22C:297 Seminar on Automata arr.
Topics from algebraic automata theory, models of parallel computation, iterative circuit computers, Turing machine theory, computational complexity, formal grammars. Prerequisite: consent of instructor.

22C:298 Seminar on Programming arr.
Topics from syntax-directed translation, compilation, multiprogramming and time sharing, formal definition and advanced programming language features; use of current hardware facilities. Prerequisite: consent of instructor.

22C:299 Readings and Research arr.
Prerequisite: consent of instructor.

Mathematics

Department chair: Eugene W. Johnson
Faculty: *professors* Kendall E. Atkinson, Nguyen P. Cac, Kent R. Fuller, Eugene W. Johnson, William A. Kirk, Erwin Kleinfeld, Frank J. Kosier, Howard W. Lambert, Bor-Luh Lin, Paul S. Muhly, Robert H. Oehmke, Paul E. Waltman, Marilyn J. Zweng
professors emeriti Nelson B. Conkwright, Edwin Oberg
associate professors Alfred J. Boals, George Burke, Victor P. Camillo, Michael A. Geraghty, Herbert W. Hethcote, Norman L. Johnson, Surjit S. Khurana, Margaret Kleinfeld, Philip C. Kutzko, John P. Lediaev, Eugene W. Madison, George C. Nelson, Vladimir Olker, Dennis M. Roseman, Harold L. Schoen, Jonathan K. Simon, Keith D. Stroyan
assistant professors Daniel D. Anderson, Matilde Macagno, Tuong Ton-That
Degrees offered: B.A., B.S., M.S., M.A.T., Ph.D.

Undergraduate Programs

See "Division of Mathematical Sciences."

Graduate Programs

The Department of Mathematics offers the M.S. degree without thesis and the Ph.D. The M.S. degree may be taken with an education option. For all of these degrees the student is required to take a two-semester sequence in algebra and a two-semester sequence in analysis. A comprehensive examination covers the material in these sequences. In the case of prospective secondary school teachers, material in required education courses is also examined. The remainder of the student's program may be chosen from any of the departments in the Division of Mathematical Sciences and from outside the Division as well. The programs seek to provide master's candidates with a common core of knowledge and to allow maximum flexibility outside of this core.

In addition to these programs, there is an M.S. program (see III below) designed for students seeking the Ph.D. in other disciplines which require a good deal of mathematical knowledge.

Master of Science

Program I (designed for secondary school teachers)

Required courses

Two from 22M:115-116 Introduction to Analysis I-II and 22M:210-211 Analysis I-II, including either 22M:116 or 22M:211;
Two from 22M:120-121 Abstract Algebra I-II and 22M:205-206 Introduction to Algebra I-II, including either 22M:121 or 22M:206; and
Two in mathematics education.

Course Distribution

A minimum of 30 semester hours of graduate credit, including at least 24 semester hours in these Division of Mathematical Sciences courses:

Any course in the Department of Mathematics numbered 100 or above, except 22M:105 Analysis for Applications;
Either 22C:122 Advanced Computer Organization and Architecture, 22C:123 Programming Language Foundations, 22C:135 Introduction to Computation Theory 22C:145 Artificial Intelligence I, or any 200-level course in computer science; and
Either 22S:153 Introduction to Probability, 22S:154 Introduction to Mathematical Statistics I, 22S:167 Introduction to Stochastic Processes, or any statistics course having any of these as a prerequisite.

Program II

Required courses

Two from 22M:115-116 Introduction to Analysis I-II and 22M:210-211 Analysis I-II, including either 22M:116 or 22M:211; and
Two from 22M:120-121 Abstract Algebra I-II and 22M:205-206 Introduction to Algebra I-II, including either 22M:121 or 22M:206.

Course Distribution

At least 30 semester hours of credit, including a minimum of 24 semester hours in the Division of Mathematical Sciences, and a minimum of 18 semester hours in the Department of Mathematics from the courses listed below:

Any course numbered 100 and above except 22M:105 Analysis for Applications;
22C:122 Advanced Computer Organization and Architecture, 22C:123 Programming Language Foundations, 22C:135 Introduction to Computation Theory, 22C:145 Artificial Intelligence I, or any 200-level course in computer science; and
22S:154 Introduction to Mathematical Statistics I, 22S:153 Introduction to Probability, 22S:167 Introduction to Stochastic Processes, or a course which has any of these as a prerequisite.

Comprehensive Examination

With the permission of the graduate committee, a candidate in this program may substitute an appropriate part of the Ph.D. comprehensive examination for part of the master's examination.

Program III

For nondepartmental students en route to a Ph.D. in another area. No required courses. Course distribution same as Program II.

Comprehensive Examination

The student in program III will be considered to have passed the comprehensive examination for the master's degree in mathematics upon satisfying the following two conditions:

Maintaining minimum grade-point average of 3.0 in all mathematics courses taken for the master's degree in mathematics; and
Successful completion of the comprehensive Ph.D. examination in the chosen area.

A student in Program III will be assigned a mathematics adviser who will work with the student and the student's adviser in his or her area outside the Division to establish an appropriate curriculum for the master's degree in mathematics.

General Information

To be admitted to candidacy for the M.S. degree in mathematics, a student must have completed work in undergraduate mathematics roughly equivalent to the program previously described for an undergraduate major in the Division of Mathematical Sciences. A student whose preparation does not meet this requirement may be required to take certain additional courses to cover the deficiency.

It is expected that candidates for the Master of Science degree will be able to complete their degree programs in four summer sessions or one academic year and one summer session. Required courses and a broad selection of electives are offered regularly during summer sessions. In addition, each semester of the academic year at least one course of interest to teachers is offered by the Division of Mathematical Sciences during the late afternoon or evening.

Doctoral Programs

Most of the recent graduates of the Ph.D. program have found positions teaching in universities or colleges.

There is ample opportunity for Ph.D. candidates to take courses in applicable mathematics, both in the Mathematics Department and other departments in the Division. There is thus no formal departmental policy distinguishing between pure and applied mathematics.

The Department of Mathematics also cooperates in interdisciplinary doctoral programs with the program in Applied Mathematical Sciences.

The requirements for the Ph.D. in mathematics include 72 hours of graduate credit, at least three years of graduate residence, including at least one at The University of Iowa, and passing of a comprehensive qualifying examination as described below. Also required in the field of research chosen by the candidate are a comprehensive examination, the writing of a thesis and a final examination. Ordinarily, the candidate must demonstrate to the adviser's satisfaction proficiency in French, German or Russian.

The qualifying examination covers three of the following areas: algebra, analysis, logic and foundations, topology. Each student decides in which three of the areas he or she wishes to be examined. The examinations are given each academic year. Further information on these examinations is available in the Mathematics office. Beginning graduate students who plan ultimately to work for the Ph.D. should follow the guidelines given above for the various M.S. programs, and should seek their advisers' help in planning a course of study that will prepare them for the comprehensive qualifying examination. Students who enter after having taken some graduate work elsewhere should likewise consult an adviser for an evaluation of the previous work and the planning of further study.

A Ph.D. in mathematics education is also

offered. For further information, consult the brochure, *Advanced Studies in Education*, available from the College of Education.

Courses

Undergraduate: LR Division

These courses are not open to graduate students except by special arrangement with chair of the Department.

22M:1 Basic Mathematical Techniques 3 s.h.
Integers, fractions, ratio and proportion, algebraic expressions and operations, simple products, linear and quadratic equations, simultaneous equations, exponents and radicals. Prerequisites: one year of high school algebra, one year of high school geometry.

22M:2 Mathematical Techniques I 3 s.h.
Equations and inequalities, functions and graphs, exponential and logarithmic functions, systems of equations and inequalities. Prerequisites: 22M:1 or one and one-half years of high school algebra, one year of high school geometry.

22M:3 Mathematical Techniques II 3 s.h.
Trigonometric functions, solutions of right and oblique triangles, complex numbers, roots of polynomial equations, sequences, permutations and combinations. Prerequisite: 22M:2 or two years of high school algebra, one year of high school geometry.

22M:4 Matrix Algebra 3 s.h.
Elementary manipulations of matrices and determinants, rank and nullity of matrices, systems of linear equations, transformations in the plane, introduction to eigenvalue theory; primarily for students who need some technical competence in use of matrices. Prerequisite: 22M:3 or three years of high school mathematics.

22M:7 Quantitative Methods I 4 s.h.
Quantitative methods for treating problems arising in biological, management, and social sciences; systems of linear equations; matrix theory; introduction to differential and integral calculus.

22M:10 Fundamentals of College Mathematics I 4 s.h.
Introduction for liberal arts students to some main concepts of mathematics: elementary set theory, Venn diagrams, logic using truth tables; probability using permutations and combinations, conditional probability, independent trials; linear equations, vectors and matrices. May be used to satisfy four hours of Liberal Arts core requirement in natural sciences. Prerequisite: two and one-half years of high school mathematics or 22M:1.

22M:11 Fundamentals of College Mathematics II 4 s.h.
Introduction to analytic geometry and trigonometry; introduction to ideas of calculus, derivatives, integrals; applications to social and natural sciences; additional elementary topics in number theory, geometry or topology, as time permits. This course or 22M:10 (but not both) may be used to satisfy four hours of core requirement in natural sciences. Prerequisite: 22M:2 or 22M:10.

22M:15 Mathematics for the Biological Sciences 4 s.h.
Relations, functions, coordinate systems, graphing, polynomials, trigonometric functions, logarithmic and exponential functions; topics in probability; all examples and applications are chosen from the biological sciences. Prerequisite: three years of high school mathematics or 22M:2.

22M:16 Calculus for the Biological Sciences 3 s.h.
Differential and integral calculus; topics in differential equations, multivariable calculus, matrices, and complex numbers; applications to the life sciences. Prerequisite: four years of high school mathematics or 22M:15.

22M:20 Elementary Functions 3 s.h.
Functions, relations, coordinate systems; properties and graphs of algebraic, trigonometric, logarithmic, exponential functions; inverse trigonometric functions; properties of lines, circles. Not intended for students who have had high school analytic geometry. Prerequisites: two years of high school algebra and one year of high school geometry or 22M:3.

22M:25 Calculus I 4 s.h.
Fundamental concepts, methods, techniques of single variable differential and integral calculus. Students in 22M:25 and 22M:26 are encouraged to enroll concurrently in 22M:29. Prerequisite: three and one-half years of high school mathematics including introduction to analytic geometry or 22M:20, or both 22M:2 and 22M:3.

22M:26 Calculus II 4 s.h.
Continuation of 22M:25. Prerequisite: 22M:25.

22M:27 Introduction to Linear Algebra 4 s.h.
The vector algebra and geometry of three-dimensional Euclidean space and extensions to n-space; lines and planes, matrices, linear transformations, systems of linear equations, reduction to row echelon form, dimension, rank, determinants, eigenvalues and eigenvectors. Students are encouraged to enroll concurrently in 22M:29. Prerequisite: 22M:25 or consent of instructor.

22M:28 Calculus III 4 s.h.
Multivariable calculus. Vector functions, line integrals, total differentials, gradient, implicit functions, coordinate systems, Taylor's expansion and extrema, multiple integrals, vector fields, surface integrals, Stokes's theorem. Prerequisites: 22M:26 and 22M:27.

22M:29 Computation Laboratory for Calculus and Linear Algebra arr.
Use of computer as aid to understanding concepts and techniques of calculus and linear algebra. Open to students concurrently enrolled in 22M:25, 22M:26, 22M:27, 22M:35 or 22M:36. No programming experience required. Up to three hours' credit may be acquired, one for each section. Prerequisites: Section 1—enrollment in 22M:25 or 22M:35; Section 2—enrollment in 22M:26 or 22M:36; Section 3 — enrollment in 22M:27.

22M:35 Engineering Calculus I 4 s.h.
One variable calculus keyed to engineering program. Derivative, curve sketching, word problems, trigonometry derivatives, two-dimensional vector algebra, plane motion. Definite integral and applications. Prerequisite: high school trigonometry, 22M:3 or 22M:20.

22M:36 Engineering Calculus II 4 s.h.
Three-dimensional vectors, cross product; natural log and exponential; formal integration; basic differential equations; conics, quadrics; weighted averages; infinite series. Continuation of 22M:35. Prerequisite: 22M:35.

22M:37 Engineering Calculus III 4 s.h.
Vector calculus keyed to engineering program. Review vector algebra; directional partial derivative, gradient; Taylor's formula, max-min; multiple integrals; coordinates; line, surface integrals, vector fields. Prerequisite: 22M:36 or 22M:26.

22M:38 Differential Equations and Linear Algebra 4 s.h.
Matrix algebra and differential equations. Review of first order differential equations; matrices and determinants, linear equations, linear dependence, eigenvalues; linear differential equations, Laplace transforms; systems. Fourth course in mathematics sequence for engineers. Prerequisite: 22M:36 or 22M:26.

Elementary Topics of General Interest

22M:50 Elements of Group Theory 3 s.h.
Sets, relations, functions, permutation groups, cyclic groups, structure of finitely generated Abelian groups; emphasis placed on illustrative examples. Prerequisite: 22M:27 or consent of instructor.

22M:55 Fundamental Properties of Spaces and Functions 3 s.h.
Elementary topological and analytic properties of the real numbers; emphasis placed on development of student's ability to handle definitions, theorems, and proofs. Prerequisite: 22M:26.

22M:70 Euclidean Plane Geometry 3 s.h.
Axiomatic treatment of foundations of Euclidean plane geometry. Prerequisite: 22M:26 or equivalent.

22M:72 Elementary Numerical Analysis 3 s.h.
Numerical solution of polynomials and general algebraic equations; numerical solution of simultaneous linear equations and matrix operations; least squares curve-fitting techniques; interpolation polynomials; numerical solution of ordinary differential equations; detailed error analysis of several of the techniques studied; illustrative programming projects. Prerequisites: 22M:26 or 22M:36 and programming experience. Same as 22C:55.

22M:80 Theory of Arithmetic 3 s.h.
Enrollment limited to candidates for elementary teaching certificate; structure of real number system. Prerequisite: 22M:1 or equivalent.

22M:81 Geometry for Elementary Teachers 3 s.h.
Enrollment limited to candidates for elementary teaching certificate or certified elementary teachers. A study of points, lines, and planes, the properties of geometric figures, measurement, coordinate geometry, and transformational geometry. Prerequisite: 22M:1 or equivalent.

Undergraduate: Upper Division

22M:100 Introduction to Ordinary Differential Equations 2-3 s.h.
First-order ordinary differential equations; second-order linear differential equations; series solutions; higher order linear and matrix differential equations; existence and uniqueness theorems. Prerequisite: 22M:26 or 22M:38.

22M:101 Introduction to Partial Differential Equations 2-3 s.h.
First-order partial differential equations, linear second-order equations, separation of variables, Laplace's and Poisson's equations, wave equation, heat equation. Prerequisite: 22M:100 or equivalent.

22M:103 Foundations of Mathematics I 3 s.h.
Intuitive set theory, construction of real number system, cardinal arithmetic, Zorn's lemma, axiom of choice, well-ordering theorem. Prerequisite: 22M:26.

22M:104 Foundations of Mathematics II 3 s.h.
Informal logic, informal axiomatic theories, Boolean algebras. Prerequisite: 22M:103.

22M:105 Analysis for Applications 3 s.h.
Multivariable calculus and vector field theory, optimization problems, infinite series and sequences, power series, uniform convergence, improper integrals. Not open to graduate students in mathematics for degree credit. Prerequisite: three semesters of undergraduate calculus.

22M:107 History of Mathematics 3 s.h.
Selected topics in the history and development of mathematics. Prerequisites: two semesters of calculus and one semester of linear algebra, or consent of instructor.

22M:110 Elementary Topology I 3 s.h.
Introduction to topological spaces or metric spaces: open and closed sets, sequences, connectedness, compactness, characterization of continuity; topological properties of one- and two-dimensional manifolds: fixed-point theorems, winding numbers, homotopy of curves, Cantor sets. Prerequisite: one year of calculus.

22M:111 Elementary Topology II 3 s.h.
Introduction to topics in topology of manifolds; topics chosen at instructor's discretion; structure of subsets of Euclidean spaces, or two- or three-dimensional manifolds. Prerequisite: 22M:110 or consent of instructor.

22M:115 Introduction to Analysis I 3 s.h.
Sets and functions, sequences and series of real numbers, limits, metric spaces, continuous functions, connectedness, completeness, compactness. Prerequisite: 22M:28, 22M:38, or 22M:55 or graduate standing.

22M:116 Introduction to Analysis II 3 s.h.
Riemann integral, fundamental theorems of calculus, elementary functions, Taylor series, sequences and series of functions, uniform convergence, Picard fixed-point theorem, existence of solutions to differential equations, implicit function theorem. Prerequisite: 22M:115.

22M:118 Complex Variables 3 s.h.
Operational course; geometry of complex plane, analytic functions; Cauchy-Goursat theorem and applications; Laurent series, residues, elementary conformal mapping. Prerequisite: 22M:28, 22M:38 or 22M:105.

22M:120 Abstract Algebra I 3 s.h.
Rings and linear algebra; groups with operators, endomorphism rings, polynomial rings, rings with chain conditions, unique factorization, matrix rings, similarity of matrices, determinants, canonical forms. Prerequisite: 22M:50.

22M:121 Abstract Algebra II 3 s.h.
Continuation of 22M:120. Prerequisite: 22M:120.

22M:124 Introduction to Probability 3 s.h.
Prerequisite: 22M:26 or 22M:36.

22M:126 Elementary Theory of Numbers 2-3 s.h.
Factorization, congruence, Diophantine equations, law of quadratic reciprocity. Prerequisite: 22M:50 or equivalent.

22M:130 Theoretical Mechanics I 3 s.h.
Newtonian mechanics. Single particle motion, conservation laws, motion of systems, Rigid body motion, statics of fluids and solids. Prerequisite: 22M:28, 22M:38 or 22M:105.

22M:131 Theoretical Mechanics II 3 s.h.
Moving coordinate systems, continuum mechanics, Lagrange's and Hamilton's equations of motion. Prerequisite: 22M:130.

22M:149 Introduction to Matrix Theory 3 s.h.
Matrices, linear transformations, determinants, Hermite form, characteristic roots, applications. Cannot be applied toward a degree in mathematics. Prerequisite: Graduate standing or consent of instructor.

22M:150 Matrix Theory 3 s.h.
Vector spaces, linear transformations, matrices, equivalence of matrices, eigenvalues and eigenvectors, canonical forms, similarity, orthogonal transformations, bilinear and quadratic forms. Prerequisite: 22M:27, 22M:38, or 22M:149.

22M:155 Field Theory 3 s.h.
Theory of fields, polynomial ideals, Galois theory. Prerequisite: 22M:121 or equivalent.

22M:160 Differential Geometry and Tensor Analysis 3 s.h.
Space curves, differentiable manifolds, vector and tensor fields, integration of forms, covariant differentiation, intrinsic geometry of surfaces. Prerequisite: 22M:28, 22M:105, or 22M:116.

22M:161 Differential Geometry 3 s.h.
Riemannian geometry, minimizing properties of geodesics, rigidity theorems, Gauss-Bonnet theorem; such topics as relativity and elementary theory of Lie groups may also be covered. Prerequisite: 22M:160.

22M:165 Topics in Geometry 2-3 s.h.
Selected topics from Euclidean, non-Euclidean, projective, or metric geometry. Prerequisite: consent of instructor.

22M:167 Theory of Graphs 3 s.h.

22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory 3 s.h.
Root-finding for nonlinear equations; polynomial interpolation; polynomial approximation of functions; numerical integration. Prerequisites: 22M:26 or 22M:36 or consent of instructor, knowledge of computer programming.

22M:171 Numerical Analysis: Differential Equations and Linear Algebra 3 s.h.
Numerical methods for initial value problems for ordinary differential equations; direct and iterative methods for linear systems of equations; eigenvalue problems for matrices. Prerequisites: 22M:28 or 22M:38 or consent of instructor, knowledge of computer programming.

22M:172 Methods of Solutions of Boundary Value Problems 3 s.h.
Expansions in orthogonal functions (series in sines and cosines, Bessel functions, Legendre, Laguerre and Hermite polynominals) and their applications to solutions of partial differential equations; method of integral equations (Green's functions); method of finite differences.

22M:173 Transform Calculus 3 s.h.
Fourier, Laplace, Mellin, Hankel and related transforms; applications to differential and difference equations. Prerequisite: 22M:118.

22M:180 Topics in Applied Analysis I 3 s.h.
Topic is selected by the instructor and the necessary mathematical tools are developed and applied; recent topics have included boundary value problems of mathematical physics, mathematical models in biology, perturbation theory. Prerequisite: consent of instructor.

22M:181 Topics in Applied Analysis II 3 s.h.

22M:195 Current Issues, Approaches and Materials in Secondary School Mathematics Teaching arr.
Philosophy and objectives, curricular problems, review and evaluation of current literature, special methods. Prerequisite: consent of instructor. Same as 7S:235.

22M:196 Topics in Mathematics arr.
Topics chosen at the discretion of the instructor to complement material covered in the regular course offerings of the Department. Prerequisite: consent of instructor.

22M:197 Individual Study and Honors in Mathematics arr.
Prerequisite: consent of adviser.

22M:199 Readings in Mathematics arr.
By registering for this course, qualified graduate students who are not mathematics majors may receive up to three semester hours credit each for 22M:25, 22M:26, 22M:27, and 22M:28; or up to two hours credit for 22M:4, 22M:50 and 22M:80. Prerequisite: consent of Department.

Core Graduate Courses

22M:200 Introduction to Topology I 3 s.h.
Introduction to basic concepts of general topology and algebraic topology; separation axioms, connectivity, compactness, completeness, metrizability, products and quotients, simplical complexes, homotopy groups, homology groups. Prerequisite: 22M:110, 22M:115, or consent of instructor.

22M:201 Introduction to Topology II 3 s.h.
Continuation of 22M:200. Prerequisite: 22M:200.

22M:205 Introduction to Algebra I 3 s.h.
Abstract algebra: algebraic systems, including semigroups, groups, rings, integral domains, polynomial rings, division rings, fields. Prerequisite: 22M:120 or equivalent.

22M:206 Introduction to Algebra II 3 s.h.
Algebraic systems including groups with operators; modules over rings; vector spaces over fields; linear transformations; matrices; partially ordered systems; lattices; Boolean algebras. Prerequisite: 22M:205. Continuation of 22M:205.

22M:210 Analysis I 3 s.h.
Sequences, series, uniform convergence, abstract integration, Lebesgue measure, LP spaces. Prerequisite: 22M:115 or equivalent.

22M:211 Analysis II 3 s.h.
Hilbert space, trigonometric series, Banach space techniques, integration on product spaces, Radon-Nikodym theorem, differentiation, Fourier transforms. Prerequisite: 22M:210.

22M:220 Introduction to Mathematical Logic I 3 s.h.
Propositional calculus, first-order predicate calculus, Godel completeness theorem, formal elementary number theory, Godel incompleteness theorem. Prerequisite: graduate standing or consent of instructor.

22M:221 Introduction to Mathematical Logic II 3 s.h.
Continuation of formal number theory, arithmetic hierarchy, Post theorem, formal recursive functions, Turing machines, Thu systems and world problems. Prerequisite: 22M:220.

Primarily for Graduates

22M:226 Introduction to Algebraic Topology 3 s.h.
Singular homology and cohomology, axioms for homology and cohomology, duality theorems in manifolds, homotopy groups. Hurewicz theorem. Prerequisite: 22M:201 or equivalent.

22M:303 Topics in Analysis 2-3 s.h.
Selected topics, including measure theory, integration, general topology. May be repeated. Prerequisite: consent of instructor.

22M:305 Topics in Topology of 3-Manifolds 2-3 s.h.
Topics chosen at discretion of instructor; topics might include: knot theory problems concerned with three-dimensional Poincare conjecture, surgery on 3-manifolds, groups with generators and relations. May be repeated. Prerequisite: 22M:201 or consent of instructor.

22M:306 Topics in Topology of Higher Dimension Manifolds 2-3 s.h.
Topics chosen at discretion of instructor; topics might include: regular neighborhoods, engulfing, high dimensional knot theory, hauptvermutung problems, bordism problems, surgery, embedding problems. May be repeated. Prerequisite: 22M:201 or consent of instructor.

22M:307 Theory of Functions of a Complex Variable 3 s.h.
Cauchy theory, series expansions, analytic continuation, types of singularities. Prerequisite: 22M:210 or consent of instructor.

22M:308 Topics in the Theory of Functions of a Complex Variable 2- 3 s.h.
Riemann surfaces; automorphic functions; conformal mapping; univalent functions; Abelian integrals; growth theorems. May be repeated. Prerequisite: 22M:307.

22M:313 Functional Analysis I 3 s.h.
Locally convex topological vector spaces, Hahn-Banach and Krein-Milman theorems, duality, Banach and Hilbert spaces. Prerequisite: 22M:211.

22M:314 Functional Analysis II 3 s.h.
Banach algebras, spectrum in Banach algebras, representation of Banach algebras, algebras of operators. Prerequisite: 22M:313.

22M:315 Abstract Harmonic Analysis I 3 s.h.
Theory of Fourier analysis in setting of locally compact topological groups; regular Borel measures in locally compact spaces. Haar measure and group algebra of locally compact group. Prerequisite: 22M:211.

22M:316 Abstract Harmonic Analysis II 3 s.h.
Abelian locally compact groups; character group, general Fourier transform, Pontrjagin duality theorem. Continuation of 22M:315. Prerequisite: 22M:315.

22M:318 Topics in Topological Dynamics 2-3 s.h.
Properties of groups of homomorphisms acting on topological spaces; principalty periodicity and its generalizations. May be repeated. Prerequisite: consent of instructor.

22M:319 Ordinary Differential Equations 3 s.h.
Existence, uniqueness and continuous dependence, linear theory, plane autonomous systems, Poincare-Bendixson theory, comparison and oscillation theorems, boundary value problems. Prerequisite: 22M:180, 22M:116 or equivalent.

22M:320 Topics in Ordinary Differential Equations 2-3 s.h.
Selected advanced topics in ordinary differential equations. Prerequisite: 22M:319.

22M:321 Topics in Applied Mathematics 2-3 s.h.
Selected topics in the application of mathematics to other disciplines. Prerequisite: consent of instructor.

22M:323 Partial Differential Equations 3 s.h.
Cauchy-Kowalewski theorem; first-order equations; classification of second-order linear equations; Sobelev spaces; introduction to elliptic, parabolic and hyperbolic operators. Prerequisite: 22M:181, 22M:116 or equivalent.

22M:324 Topics in Partial Differential Equations 2-3 s.h.
Selected advanced topics in partial differential equations. Prerequisite: 22M:323 or consent of instructor.

22M:330 Topics in Algebra 2-3 s.h.
Selected topics, including ideal theory, structure of rings, groups, group representations and lattice theory. Prerequisite: 22M:206 or consent of instructor.

22M:334 Topics in Semigroup Theory 2-3 s.h.
Ideal theory and congruence theory in semigroups; partial structure theory of semigroups; relationships between semigroups and automata. Prerequisite: 22M:206 or consent of instructor.

22M:335 Topics in Nonassociative Algebra 2-3 s.h.
Structure theory of various classes of algebras and interrelationships among these classes; relationships between algebras and geometrics and between algebras and domains of positivity. Prerequisite: 22M:206 or consent of instructor.

22M:340 Homological Algebra 3 s.h.
Modules, tensor products, groups of homomorphisms, categories, functors, homology functors, projective and injective modules, derived functors, torsion extension functors, homological dimension. Prerequisite: 22M:206 or equivalent.

22M:345 Algebraic Topology 3 s.h.
Simplicial complexes, homology and cohomology theory of simplicial complexes, chain complexes, singular homology and cohomology theory, homotopy groups, relations between homology and homotopy. Prerequisite: 22M:226.

22M:347 Topics in Algebraic Topology 2-3 s.h.
Topics chosen from algebraic topology at instructor's discretion, for example, topics from bundle theory, homology or cohomology theories, homotopy theory, sheaves, or homological algebra. Prerequisite: 22M:226 or consent of instructor.

22M:352 Theory of Probability I 3 s.h.
Basic concepts; distribution and characteristic functions; convergence theorems; conditional expectations; stochastic processes. Prerequisite: 22M:211. Same as 22S:264.

22M:356 Topics in Metric Geometry 2-3 s.h.
Topics selected from geodesic geometry, functional analysis, fixed-point theory.

22M:371 Numerical Solutions of Partial Differential Equations 3 s.h.
Numerical solutions of various types, partial differential equations, initial and boundary value problems. Prerequisites: 22M:171 and 22M:150, or consent of instructor.

22M:389 Seminar: Algebra arr.
Prerequisite: consent of instructor.

22M:391 Seminar: Logic and Foundations of Mathematics arr.
Prerequisite: consent of instructor.

22M:392 Seminar: Topology arr.
Prerequisite: consent of instructor.

22M:395 Seminar: Analysis arr.
Prerequisite: consent of instructor.

22M:396 Seminar: Functional Analysis arr.
Prerequisite: consent of instructor.

22M — Seminar: Numerical Analysis arr.
Prerequisite: consent of instructor.

22M:399 Reading and Research arr.
Prerequisite: consent of adviser.

Statistics

Department chair: Robert V. Hogg
Faculty: *professors* Warren T. Dent, Leonard S. Feldt, Robert A. Forsyth, Robert V. Hogg, Peter A. Lachenbruch, Paul S. Muhly, Melvin R. Novick, John S. Ramberg, Timothy J. Robertson
professors emeriti Allen T. Craig, Lloyd A. Knowler
associate professors John J. Birch, James D. Broffitt, Jonathan D. Cryer, Hiram D. Hoover, Dee Norton, Ronald H. Randles, George G. Woodworth, Robert F. Woolson, Richard W. Zlock
assistant professors Stuart A. Klugman, Russell V. Lenth
Degrees offered: B.A., B.S., M.S., Ph.D.

Statisticians build mathematical models for processes which involve uncertainty, so that they may better understand and perhaps control these processes. In addition, statisticians help design and analyze scientific experiments. Because uncertainty is such a pervasive feature of life, statisticians are employed in almost every facet of our technologically advanced society. They are employed in industry (e.g., in the quality control of production processes) and as actuaries in insurance firms. In the government, they design and carry out statistical analyses, such as those of the Census Bureau and the Bureau of Labor Statistics. They serve in academic institutions, not only in statistics itself, but in medicine, social sciences, engineering, education and other fields where modern research techniques are applicable.

Undergraduate Program

See "Division of Mathematical Sciences."

Graduate Program

The graduate program is designed to reflect the dual role of statistics, as an independent discipline within the mathematical sciences and as a research tool. The Department offers programs leading to the M.S. degree under both thesis and nonthesis plans, in the fields of theoretical statistics and probability, applied statistics, and actuarial science. Programs leading to the Ph.D. degree are offered in theoretical statistics, probability and applied statistics. The Department also cooperates in developing interdisciplinary doctoral programs under the Program in Applied Mathematical Science.

To be admitted to the graduate program, the applicant should have an undergraduate major in one of the mathematical sciences. With the approval of the Department, selected candidates may be granted admission on the basis of mathematical training through calculus.

Master's Degree Programs

Each M.S. candidate will have a committee of three members which will have the responsibility of recommending action on the candidate's degree. For nonthesis programs, the committee's recommendation is usually based on two two-hour written examinations on topics covered in the required courses. For thesis programs, the committee's final recommendation is usually based upon an oral defense of the thesis, although it may be based upon a two-hour written examination over the topics covered in the candidate's program of study.

A student who chooses to earn the M.S. degree with thesis may earn up to six semester hours of credit for thesis preparation. Specific course requirements for the M.S. programs are given below. The minimum grade-point average for each of these programs is 2.75.

Actuarial Science

(with or without thesis)

22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics I
22S:180-182 Actuarial Theory I-III
22S:177 Numerical Analysis for Actuaries
22S:297 Seminar: Actuarial Theory

At least three courses from:
22S:178 Graduation
22S:183 Demography and Life Table Construction
22S:184 Risk Theory
22S:185 Theory of Pension Funding

Students must take at least one course from outside the Division of Mathematical Sciences, preferably from the College of Business Administration. The 22S:153-154 requirement will be waived only if the student has passed Part Two of the Examinations of Society of Actuaries.

Theoretical Statistics and Probability

(with or without thesis)

22M:115 Introduction to Analysis I
22S:153 Introduction to Probability
22S:154-155 Introduction to Mathematical Statistics I-II
22S:167 Introduction to Stochastic Processes

At least two of these:
22S:170 Introduction to Nonparametric Statistics
22S:172 Topics in Statistics
22S:253-254 Theory of Statistics I-II
22S:255 Linear Models
22S:256 Multivariate Analysis
22S:264-265 Theory of Probability I-II

Applied Statistics

(without thesis)

22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics I
22S:158 Analysis and Design of Experiments

22S:156 Applied Time Series Analysis
or
22S:161 Application of Multivariate Statistical Techniques
or
22S:162 Regression Analysis
22S:173 Statistical Computation and Consulting

At least two of these:
22S:103, 22S:133, 22S:138, 22S:155, 22S:156, 22S:160, 22S:161, 22S:162, 22S:170, 22S:239, 22S:255, 22S:256, 22M:170

The remainder of the program will consist of selections from the above lists or other courses approved by the adviser.

Experience in a computer language (PL/1, FORTRAN or BASIC) is required. If the student satisfies the requirement by taking a course, that course may not be counted toward the M.S.

This applied program is intended to provide sufficient flexibility so that a student may study in an area of application in addition to the required statistics courses.

A program oriented towards biostatistics would include 22S:103, 22S:161, and 22S:162 and electives chosen from among 63:158, 63:176, 63:101-102, and 63:259.

Students interested in operations research could choose electives from among 22S:155, 22S:160, 22S:167, 586:141, 586:142, 586:143, 586:147, 586:149-249, 586:242-243, 586:245, and 586:248.

Programs oriented towards other applied areas are also possible.

For a general program in applied statistics (without area of application), most electives would be courses in the Department of Statistics. The student should work closely with his or her adviser in developing a program of study tailored to the student's specific interests. If the student's interest in an applications area is particularly strong, a program in another department may be more appropriate; for example, educational measurement and statistics (Education), operations research (Industrial and Management Engineering), and biostatistics (Preventive Medicine and Enviromental Health).

Applied Statistics

(with thesis)

22S:153-154
22S:156 or 22S:158 or 22S:161 or 22S:162 (at least 2)

At least two of these:
22S:103, 22S:133, 22S:138, 22S:155, 22S:156, 22S:158, 22S:160, 22S:161, 22S:162, 22S:170, 22S:173, 22S:239, 22S:255, 22S:256, 22M:170.

The remainder of the program will consist of selections from the above courses or, with the adviser's approval, courses in other fields related to the thesis.

Experience in a computer language (PL/1, FORTRAN, or BASIC) is required. If the student satisfies the requirement by taking a course, that course may not be counted toward the M.S.

Ordinarily involving 3 s.h. of 22S:191 for two semesters, the typical thesis would be a statistical presentation of the results of a meaningful research project in another field, or a study of the characteristics of a new statistical method.

Doctor of Philosophy

To satisfy the course requirements for a Ph.D. in statistics, a student must successfully complete:

22S:153 Introduction to Probability
22S:154-155 Introduction to Mathematical Statistics I-II
22S:158 Analysis and Design of Experiments
22S:167 Introduction to Stochastic Processes
22S:173 Statistical Computation and Consulting
22M:115-116 Introduction to Analysis I-II

At least two of the following:
22S:156 Applied Time Series Analysis
22S:161 Application of Multivariate Statistical Techniques
22S:162 Regression Analysis
22S:170 Introduction to Nonparametric Statistics

At least five of the following:
22S:253-254 Theory of Statistics I-II
22S:255-256 Linear Models - Multivariate Analysis
22S:264-265 Theory of Probability I-II

(It is recommended that students take 22S:173, for at least two hours credit, in two different semesters.)

In addition, each semester a graduate student is registered for six or more credit hours, the student's registration must include at least one course of at least two hours of credit offered by the Statistics Department, other than 22S:191 Individual Study,

22S:197 Readings in Statistics and/or Actuarial Science, or 22S:299 Reading Research.

During the graduate program, students may wish to take coursework or seminars in other departments for the achievement of certain auxiliary goals of the doctoral degree in Statistics — to relate his or her area of specialization to other fields of knowledge, to acquire the ability to use electronic digital computing equipment, or to learn the language skills needed to read foreign scientific journals and be able to respond in personal contacts with foreign statisticians.

Each student is required to include in his or her program a component which involves experience in either teaching or statistical consulting.

Students expecting to request financial assistance for the third year must have taken the qualifying examination by the spring semester of the second year.

The qualifying examination covers topics studied in 22S:153 Introduction to Probability, 22S:154-155 Introduction to Mathematical Statistics I-II, and 22S:158 Analysis and Design of Experiments. The examination may be used in lieu of the master's written examination.

The student requests a comprehensive examination after completing most of the coursework in his/her approved plan of study, typically near the end of the third year or later.

The student must achieve at least a 3.25 grade-point average on all courses in the plan of study.

A program which does not conform to the prescribed requirements, but which is of high excellence, may be approved by the Department chair.

Special Features

Because statisticians are often teamed with other scientists in research projects, it is important that students gain experience in group efforts. In several courses, the Department tries to provide this experience. In addition, the Department houses the Statistical Consulting Center, which offers assistance to members of the University community in the planning of experiments and carrying out the analysis of experimental data. Under faculty supervision, graduate students participate in these activities as part of their training. Although the majority of projects involve statistical problems arising in thesis research conducted by students in other departments, the Center also seeks involvement in larger research projects and in the writing of proposals. For example, a team of students and faculty performed an extensive analysis of the factors relating to highway deaths in Iowa.

Courses

Primarily for Undergraduates

Note: No student who has received credit for a course offered by the Department of Statistics numbered above 100 may receive credit for subsequently taking a course numbered below 100.

22S:6 Quantitative Methods II **4 s.h.**
Continuation of 22M:7. Descriptive statistics, elementary probability, estimation and testing, chi-square tests, regression and correlation, analysis of variance.

22S:25 Elementary Probability and Statistics **3 s.h.**
Graphing techniques for presenting data, percentiles, measures of central tendency and dispersion, correlation, regression and prediction, set approach to probability, distributions of random variables and statistics, large sample theory, estimation and tests of significance, introduction to the analysis of variance, introduction to nonparametric statistics. Prerequisite: college algebra or equivalent.

22S:39 Probability and Statistics for the Engineering and Physical Sciences **3 s.h.**
Finite probability models, random variables, important discrete and continuous distributions, descriptive statistics, point and interval estimation, tests of hypotheses, regression. Prerequisite: 22M:36 or equivalent. Same as 580:39.

For Undergraduates and Graduates

22S:101 Biostatistics **3 s.h.**
Elementary course on statistical methods primarily for research in health science and related fields. Topics include descriptive statistics and an introduction to estimation and tests of hypotheses.

22S:102 Introduction to Statistical Methods **3 s.h.**
Primarily for students who are not statistics majors. Same as 7P:143, 31:143.

22S:103 Introduction to the Design of Sample Surveys **3 s.h.**
Prerequisite: 22S:25 or 22S:102. Same as 63:163.

22S:105 Geostatistics **2 s.h.**
Same as 12:155.

22S:120 Probability and Statistics **4 s.h.**
Finite and general probability models, random variables, functions of random variables, expectations, discrete and continous distributions, estimation and hypothesis testing, regression. Prerequisite: 22M:26 or 22M:36.

22S:125 Actuarial Principles of Life Insurance **3 s.h.**
Primarily for students who are not actuarial science majors. Elements from probability and mathematics of finance developed and applied to problems in determination of insurance net premiums, reserves, asset shares, and gross premiums; related topics in group and casualty insurance. Same as 68:125.

22S:127 Applied Statistical Methods and Computations **3 s.h.**
Practical introduction to sampling, statistical analysis packages, confidence intervals, test of hypothesis, and analysis of relationships; intended mainly for students in the social sciences.

22S:131 Statistical Methods with Applications **3 s.h.**
Same as 586:131.

22S:133 Quality Control, Reliability and Engineering Statistics **3 s.h.**
Prerequisite: 22S:131. Same as 586:133.

22S:138 Bayesian Statistics I **3 s.h.**
Prerequisite: 22S:102. Same as 7P:148.

22S:140 Design Analysis of Experiments in Biomedical Sciences **3 s.h.**
Same as 63:162.

22S:148 Intermediate Statistical Methods **4 s.h.**
Prerequisite: 22S:102 or equivalent. Same as 7P:243.

22S:153 Introduction to Probability **3 s.h.**
Introduction to theory and application of probability models, including elementary combinatorics, random variables, conditioning, independence, moments, generating functions, basic probability models, random walks. Prerequisite: 22M:26 or 22M:36.

22S:154 Introduction to Mathematical Statistics I **3 s.h.**
Sampling distribution theory, point and interval estimation, statistical hypotheses including likelihood ratio tests, analysis of variance, regression, and certain chi-square tests. Prerequisites: 22S:153 and 22M:26 or 22M:36.

22S:155 Introduction to Mathematical Statistics II **3 s.h.**
Nonparametric methods, sufficient statistics, and other topics such as sequential analysis, multiple comparison, classification, robust procedures, and further regression, ANOVA, and normal distribution theory. Continuation of 22S:154.

22S:156 Applied Time Series Analysis **3 s.h.**
Fall. General stationary and nonstationary models, autocovariance and autocorrelation functions, spectral density functions, linear stationary and nonstationary models, identification, estimation and forecasting in linear models, estimation of the spectral density; analysis of time series data via general purpose digital computer. Prerequisite: 22S:120 or 22S:131.

22S:157 Correlation Methods **3 s.h.**
Prerequisite: 22S:148 or 22S:120. Same as 7P:244, 31:244.

22S:158 Analysis and Design of Experiments **4 s.h.**
Models in analysis of variance, single factor multiple comparisons, blocking, multiple factors; crossed, nested, and repeated-measures designs, Latin squares, mixed models, unbalanced experiments, splitplot designs, analysis of covariance, factorial and fractional factorial designs, response surface methodology. Spring. Prerequisites: 22S:120, 22S:131, or 22S:154. Same as 586:231.

22S:159 Design of Experiments **4 s.h.**
Prerequisite: 22S:148. Same as 7P:246.

22S:160 Applied Statistical Decision Theory **3 s.h.**
Comparison of decision rules including Bayes' and minimax rules; decision theoretic viewpoint of classical statistics; multiple decisions; inventory, capital investment, control theory applications. Prerequisite: 22S:39.

22S:161 Application of Multivariate Statistical Techniques **3-4 s.h.**
Fall. Prerequisite: 22S:158, 22S:162 or equivalent. Same as 7P:245.

22S:162 Regression Analysis **3 s.h.**
Analysis of multiple linear regression models, residual

analysis, variate selection, simultaneous inference, robust procedures. Prerequisite: 22S:120, 22S:131 or 22S:154. Same as 586:232.

22S:163 Distribution Free Statistical Methods 2-3 s.h.
Prerequisite: 22S:148. Same as 7P:247.

22S:167 Introduction to Stochastic Processes 3 s.h.
Theory and application, including branching processes, random walks, Markov chains, Poisson processes, second order processes, Wiener and general Gaussion processes. Spring. Prerequisite: 22S:153.

22S:170 Introduction to Nonparametric Statistics 4 s.h.
Distribution-free techniques, U-statistics, asymptotic efficiency, nonparametric point and interval estimation, procedures based on ranks. Prerequisite: 22S:154.

22S:172 Topics in Statistics 3 s.h.
Problems selected by instructor for relevance; basic ideas in probability and statistics will be applied to building models of real systems, making scientific inferences and management decisions. Prerequisite: 22S:120, 22S:131 or 22S:154.

22S:173 Statistical Computation and Consulting 1-4 s.h.
Use of standard computer programs for analyzing data and performing statistical estimation and testing procedures. Participation in consulting projects involving research by University students and faculty members; students repeating the course have greater consulting responsibilities. Prerequisite: 22S:158 or consent of instructor.

22S:177 Numerical Analysis for Actuaries 3 s.h.
Introduction to calculus of finite differences, interpolation, numerical differentiation and integration, solution of nonlinear equations. Spring. Prerequisite: 22M:26 or 22M:36.

22S:178 Graduation 3 s.h.
Methods of fitting smooth curves to tabled data include graphic interpolation, moving-weighted-average, difference equation, and mathematical model. Also methods of testing a graduation. Fall. Prerequisite: 22S:177.

22S:180 Actuarial Theory I 3-4 s.h.
Advanced mathematics of finance including annuities certain, bonds, depreciation, sinking funds, amortization schedules, yield rates; fourth hour includes introduction to the life table, commutation functions, net premiums and reserves. Students who have taken or are currently enrolled in 22S:125 or an equivalent course may take only 3 s.h. Fall. Prerequisite: 22M:26 or 22M:36.

22S:181 Actuarial Theory II 4 s.h.
Mathematical theory of single-life contingencies; includes measurement of mortality, life annuities and insurances, net premiums, reserves, special topics and population theory. Spring. Prerequisite: 22S:180 or 22S:125.

22S:182 Actuarial Theory III 4 s.h.
Mathematical theory of multi-life contingencies, including joint and last survivor and general status, contingent funtions and reversionary annuities. Also covers multiple-decrement tables and the generalized model applied to disability and accidental death insurance and retirement systems. Fall. Prerequisite: 22S:181.

22S:183 Demography and Life-Table Construction 4 s.h.
Construction of life tables, analysis of mortality and morbidity data based on insurance company studies and population statistics; collection of census and vital statistics, detection and measurement of errors. Spring. Prerequisite: 22S:125 or 22S:180.

22S:184 Risk Theory 3 s.h.
Individual and collective risk models for insurance systems; methods of approximating distribution of total claims and probability of ruin; applications to management of insurance systems. Fall. Prerequisite 22S:153 and 22S:125 or 22S:180.

22S:185 Theory of Pension Funding 3 s.h.
Regulation of pensions under Employee Retirement Income Security Act; actuarial cost methods, measuring gain or loss, early and special retirement factors, asset valuation. Spring. Prerequisite: 22S:180.

22S:189 Topics in Actuarial Science 2-3 s.h.
Topics selected by instructor for relevance to specific problems in actuarial science. Prerequisite: 22S:180.

22S:191 Individual Study arr.
For M.S. thesis students. Prerequisite: consent of adviser.

22S:197 Readings in Statistics and/or Actuarial Science arr.
Prerequisite: consent of Department.

Primarily for Graduates

22S:239 Bayesian Statistics II 3 s.h.
Prerequisite: 22S:138. Same as 7P:240.

22S:253 Theory of Statistics I 3 s.h.
Limiting distribution theory, sufficiency, introduction to decision theory and Bayesian inference. Prerequisite or corequisite: 22S:155.

22S:254 Theory of Statistics II 3 s.h.
Theory of estimation and tests of hypotheses, current research topics in statistics. Prerequisite: 22S:253.

22S:255 Linear Models 4 s.h.
Linear spaces and matrices, multivariate normal distribution and distributions of quadratic forms, full rank and nonfull rank linear models, estimability, simultaneous confidence intervals, random and mixed models. Prerequisite: 22S:154 and 22S:158.

22S:256 Multivariate Analysis 4 s.h.
Stein estimators, Wishart distribution, Hotelling's T, multivariate linear model, growth curve models, discriminant analysis, canonical correlation. Prerequisite: 22S:255.

22S:264 Theory of Probability I 3 s.h.
Probability spaces and random variables, basic integration theorems, distribution and characteristic functions, types of covergence, independence, laws of large numbers, central limit theorems. Prerequisite: 22M:116. Same as 22M:352.

22S:265 Theory of Probability II 3 s.h.
A sequel to 22S:264. Conditioning, limit theorems, L spaces, markov processes, Martingales. Prerequisite: 22S:264.

22S:266 Topics in Probability and Statistics 3 s.h.
Selected topics in theory of probability of particular interest to instructor. Prerequisite: consent of instructor.

22S:271 Statistical Inference I 4 s.h.
General decision problem; unbiased estimation; lower bounds for variance and complete sufficient statistics; minimax estimation and empirical Bayes estimates. Prerequisite: 22S:264 or equivalent.

22S:272 Statistical Inference II 3 s.h.
Uniformly most powerful tests; distributions with monotone likelihood ratios, least favorable distributions; similar and unbiased tests, principle of invariance, compound and multiple decision problems. Continuation of 22S:271.

22S:291 Seminar: Mathematical Statistics arr.
Prerequisite: consent of instructor.

22S:293 Seminar: Probability arr.
Prerequisite: consent of instructor.

22S:295 Seminar: Applied Statistics arr.
Prerequisite: consent of instructor.

22S:297 Seminar: Actuarial Theory arr.
Prerequisite: consent of instructor.

22S:299 Reading Research arr.
Prerequisite: consent of adviser.

Medical Technology

See "Pathology."

Microbiology

Department chair: Irving P. Crawford
Degrees offered: B.S., M.S., Ph.D.

Undergraduate Study

Microbiology is a science concerned with identification, structure and activities of bacteria, fungi, protozoa, algae and viruses. It also includes immunology, a discipline dealing with the response of man and animals to foreign material.

Microbiology involves study of the distribution of microorganisms in nature, their relationships to each other and to other living things, their beneficial and harmful effects on man, animals, and plants, and the physical and chemical changes they produce in the environment.

All branches of the science—general microbiology, food and dairy microbiology, soil microbiology, plant microbiology, water and sewage microbiology, medical and veterinary microbiology, dental microbiology, immunology, pharmaceutical microbiology, marine microbiology, geomicrobiology—have expanded rapidly in recent years and offer rewarding career opportunities to qualified persons.

Microbiology is an excellent major for undergraduate students who want a good general education with emphasis on an important and interesting science. For the graduate of a bachelor's degree program in microbiology, positions are available in government, hospitals, public health and industrial control, research and teaching laboratories.

Students who continue beyond the bachelor's degree have career opportunities in these same areas, plus college and university teaching, with greater responsibilities and commensurately higher salaries.

The Bachelor of Science Degree

The objectives of the undergraduate program in microbiology are to prepare students for careers in science, especially in their chosen majors, and to provide them with a broad background in other subjects, so they may relate microbiology to other fields of human endeavor.

An undergraduate student majoring in microbiology at Iowa must meet general College of Liberal Arts requirements. The student must complete a minimum of 14 semester hours in microbiology to obtain a B.S. degree; no more than 2 semester hours of special problems (61:161 Problems in Microbiology) may count toward this requirement. Students desiring to apply for certification by the National Registry of Microbiologists are required to earn 30 s.h. of credit in biology, 20 semester hours of which must be in microbiology. Certification is required for employment or advancement in some areas. Mathematics and science courses required by the Department for the B.S. degree should be taken for letter grades, except under unusual circumstances with the consent of the adviser. This is a typical curriculum for undergraduate majors:

Freshman Year

First Semester

4:13 Principles of Chemistry I	3 s.h.
22M:15 Mathematics for the Biological Sciences	4 s.h.
or	
22M:20 Elementary Functions	3 s.h.
10:1 Rhetoric	4 s.h.
10:3 Rhetoric	4 s.h.
Foreign language	3-4 s.h.
Physical education	2 s.h.
Total	15-16 s.h.

Second Semester

4:14 Principles of Chemistry II	3 s.h.
4:16 Elementary Chemistry Laboratory I	2 s.h.
Core course	
or	
*22M:16 Calculus for the Biological Sciences	3 s.h.
or	
*22M:25 Calculus I	4 s.h.
or	
*22M:35 Engineering Calculus I	4 s.h.
Foreign language	3-4 s.h.
10:2 Rhetoric (for those who took 10:1)	4 s.h.
Total	15- 17 s.h.

Sophomore Year

First Semester

4:121 Organic Chemistry I	3 s.h.
37:3 Principles of Animal Biology	5 s.h.
Core course	
or	
*22M:26 Calculus II	4 s.h.
or	
22M:36 Engineering Calculus II	4 s.h.
**61:157 General Microbiology	4 s.h.
Total	16 s.h.

Second Semester

4:122 Organic Chemistry II	3 s.h.
4:141 Intermediate Chemistry Laboratory I	2 s.h.
4:101 Elementary Quantitative Analysis	4 s.h.
Core, elective, or advanced microbiology courses	8 s.h.
Total	17 s.h.

Junior Year

First Semester

99:120 The Chemistry of Biological Materials	3 s.h.
29:11 College Physics	4 s.h.
Physical education	2 s.h.
Core, elective, or advanced microbiology courses	6-8 s.h.
Total	15-17 s.h.

Second Semester

99:130 Metabolism	3 s.h.
29:12 College Physics	4 s.h.
Core, elective, or advanced microbiology courses	8 s.h.
Total	15 s.h.

Senior Year

Core, elective, or advanced microbiology courses	30-34 s.h.

*Optional, but may be desirable for students planning to do graduate work.

**May also be taken the first semester of the junior year.

The Honors Program

Open to seniors with a grade-point average of at least 3.0 overall and a 3.2 in microbiology courses, the Honors Program in Microbiology involves taking 20 semester hours of coursework in microbiology, including six semester hours in 61:171-172 Honors Microbiology. These two courses constitute an introduction to experimental research. At the end of the research, the student presents a written report. There is also an Honors examination. A student successfully completing these requirements receives the B.S. degree with honors.

Graduate Study, Faculty Roster, Courses

See "College of Medicine."

Military Science

(Army Reserve Officers Training Corps)

Department head: Lieutenant Colonel Carl J. Haaland
Faculty: *professor* Carl J. Haaland (Lieutenant Colonel) *assistant professors* Don M. Miller (Captain) and Don E. Ishmael (Captain)

Programs

The purpose of the Army Reserve Officers Training Corps (ROTC) program is to train female and male college students to become Army officers. Graduates receive second lieutenants' commissions. Participation is voluntary. The program administered by the Department of Military Science, which is an academic department of the University, offers credits applicable toward any degree awarded by the College of Liberal Arts.

The Basic Course, taken over the freshman and sophomore years, provides instruction in the fundamentals of leadership development and military skills. Emphasis is placed on involvement in outdoor and physical activities. Enrollment in the Basic Course involves no service obligation.

Students demonstrating officer potential are selected for the Advanced Course, taken over the junior and senior years and including advanced leadership, military administration and management training, instruction in the theory and dynamics of

military operations, military staff procedures, and military law.

Students who have not taken the Basic Course may qualify for the Advanced Course by attending a paid basic six-week summer training camp or by enrolling for a summer, on-campus Military Science course. Certain veterans may also be eligible for immediate entry into the Advanced Course.

Cadets attend a six-week paid advanced training camp at Fort Lewis, Washington, between the junior and senior years. Selected cadets may also participate in U.S. Army Ranger and Airborne training.

Credit For Prior Training

Students who have had military instruction elsewhere may receive credit for comparable coursework at Iowa. All students with prior military experience should contact the Department to gain ROTC credit toward a commission.

Although the full Army ROTC program normally spans four years, it can be completed in two, three, or three and a half years, with departmental approval.

Graduate School

Students commissioned as lieutenants upon graduation from Iowa may apply for a delay of entry on active duty to attend graduate school. No additional time is required on active duty for such delays. Delays up to three years to attend medical, dental, and law schools are normally accepted.

Financial Aid

ROTC scholarships, providing tuition, books, laboratory fees and a $100 per month tax-free subsistence allowance, are available to high school seniors and students enrolled in Military Science courses. All cadets in the Advanced Course receive a $100 per month tax-free subsistence allowance. Cadets attending summer camps and Ranger and Airborne training are paid while there and receive travel allowances. Students are supplied with books for University classes taught by military faculty and uniforms for training exercises. Veterans continue to draw both the ROTC allowances plus any GI Bill benefits to which they are entitled.

Service Obligations

Completion of the Advanced Course entails a commitment to serve three years as an Army officer or approximately 90 days of active duty followed by service in an Army Reserve or National Guard unit in the Active Duty for Training (ADT) program for nonscholarship cadets. All students who receive a ROTC scholarship accept a four-year service commitment.

Special Programs

The Pershing Rifles and Black Berets are fraternal organizations engaging in intercollegiate military competitions and service activities. The Cordeliers is an auxiliary to Pershing Rifles and members participate with cadets in many activities. The Department also sponsors a small-bore rifle team which engages in national competition.

Cadets compete for individual local and national awards for leadership, academic achievement, athletics, and military proficiency. The Department sponsors military-oriented ceremonial and social activities throughout the year, including the annual Military Ball, an awards ceremony, and several mixers and picnics.

Special Facilities

The Department uses several areas near Iowa City for practical field problems and military skills instruction. It uses a variety of military equipment, such as helicopters and FM radios, in the practical leadership exercises and in support of Pershing Rifles. Cadets visit Rock Island Arsenal, Rock Island Corps of Engineers District, and Camp Dodge, near Des Moines, to observe army operations and review equipment. Junior-year cadets also use the Camp Dodge leadership reaction course, orienteering course, and rappelling facilities.

Courses

23:90 Practicum in Military Skills **0 s.h.**
Students select courses and activities which include Tae Kwon Do, riflery/marksmanship, rappelling, orienteering, physical conditioning, adventure training, survival training, cross country skiing, river operations, snow shoe exercises, and backpacking.

23:91 Practicum in Military Skills **1 s.h.**
Continuation of 23:90. Credit applies to College of Liberal Arts physical skills requirement.

23:92 Practicum in Military Skills **0 s.h.**
Students select courses and activities which include Tae Kwon Do, riflery/marksmanship, rappelling, orienteering, physical conditioning, adventure training, survival training, cross country skiing, river operations, snow shoe exercises, and backpacking.

23:93 Practicum in Military Skills **1 s.h.**
Continuation of 23:92. Credit applies to College of Liberal Arts physical skills requirement.

23:95 Foundations of Military Organizations **1 s.h.**
Overview of opportunities and responsibilities of Army officers, typical organizations where junior officers can expect assignments, officer specialty programs, and branches of the Army and their relationship to academic disciplines.

23:96 Tactical Military Analysis **1 s.h.**
Introduction to tactical military leadership responsibilities with application to topographical maps and emphasis on the correlation of map features with corresponding terrain features. Students participate in a field orienteering exercise.

23:116 Decision Analysis **3 s.h.**
Leadership techniques applicable within the military and civilian environment; motivation of individuals; behavior characteristics of groups; communications characteristics, counseling techniques, and the decision-making process.

23:117 Principles of Military Operations **3 s.h.**
Fundamentals of combat orders and combat planning with application to small units; detailed examination of the organization, communication, and functioning of the rifle company in a tactical environment to include defense, offense, retrograde, artillery fire support, and airmobile operations.

23:118 Law and Organizations **3 s.h.**
Detailed study of military staff organization, functions, and procedures; military team structure; material and financial management; and military law.

23:119 Administrative Management **3 s.h.**
Administrative, logistical, and management duties and concerns of junior officers; modern management and administration practices and techniques; seminars on contemporary subjects and standards and responsibilities of military officers.

Museum Training

Department head: George D. Schrimper
Faculty: *assistant professor* George D. Schrimper
instructor Joseph B. Meder

The Department offers courses which give the student a comprehensive background in the conceptual, design and production phases of exhibit preparation and the general operational procedures of small science museums. The museum field is expanding, and graduates of the University occupy positions of responsibility as directors, curators and exhibit specialists in museums throughout the United States and Canada.

A major in one of the natural science disciplines (zoology, geology or botany) anthropology or general science is recommended for students preparing for museum careers. Courses are offered during the annual eight-week Summer Session, as well as the regular academic year. They are

elective college work, counting as credit toward the B.A. or B.S. degree. As graduate work, museum courses may be credited as a formal minor concentration on a master's degree in Anthropology or Science Education, or the Ph.D. degree in Science Education. Inquiries regarding program details should be directed to the appropriate major department.

Techniques presented in the Museum Laboratory are of value not only to those intending to pursue museum careers, but also to predental, geology, zoology and anthropology students. Advanced museum students are afforded the opportunity to gain practical working experience by participating directly in the Museum of Natural History exhibit program.

Courses

(All registration by consent of instructor.)

24:101 Museum Technique 1-2 s.h.
Collecting, preparing and exhibiting biological materials for museum, classroom teaching or repository uses; cataloging and specimen data retrieval.

24:102 Museum Technique 1-2 s.h.
Continuation of 24:101, but may be taken as independent unit.

24:103 Museum Accessory Work 1-2 s.h.
Techniques used in preparation of classroom teaching materials and museum exhibit accessories; instruction in various casting and modeling procedures used in preparation or replication of archaeological, geological, zoological, or botanical specimens.

24:104 Museum Accessory Work 1-2 s.h.
Continuation of 24:103, but may be taken as independent unit.

24:110 Principles of Exhibit Theory and Design 2 s.h.
Directed study presentation of conceptual and design considerations employed in planning and execution of thematic science exhibits; group discussions and field trip. Prerequisites: 24:101 and 24:103, or consent of instructor.

24:111 Principles of Exhibit Theory and Design 2 s.h.
Continuation of 24:110, but may be taken as independent unit. Prerequisites: 24:101 and 24:103, or consent of instructor.

24:112 Special Readings and Projects: Science Museums arr.
Advanced readings in historical development, educational philosophy and role in modern society of science museums; directed-study individual projects coordinated with exhibits program or collections of Museum of Natural History. Prerequisite: 24:110 or 24:111.

24:113 Special Reading and Projects: Science Museums arr.
Continuation of 24:112, but may be taken as independent unit. Prerequisite: 24:110 or 24:111.

Music

School director: Himie Voxman
Faculty: *professors* Kenneth Amada, Paul Anderson, James Avery, Walter T. Atcherson, Thomas Ayres, Rita Benton, Thomas Davis, James Dixon, Richard B. Hervig, William Hibbard, John D. Hill, Donald Jenni, Edward L. Kottick, Albert T. Luper, Betty Bang Mather, Lyle Merriman, Don V Moses, Eldon Obrecht, Allen Ohmes, Frank Piersol, William Preucil, Erwin Schneider, John Simms, Thomas Turner, Himie Voxman
associate professors John A. Beer, Richard J. Bloesch, Frederick Crane, Lowell Cross, Norma Cross, Delbert Disselhorst, Robert Eckert, Albert Gammon, Steven Hedden, Richard Heschke, Leopold LaFosse, James Lakin, Carole Lesniak, Peter T. Lewis, Dorothy McDonald, Marvin Thostenson, Ronald Tyree, John Van Cura, Charles Wendt
assistant professors Clark Bedford, Kerry Grippe, Sven Hansell, Don R. Haines, Morgan Jones, Martha Shell, Robert Yeats
instructor Martha Letterman
Degrees offered: B.A., B.M., M.A., M.F.A., D.M.A., Ph.D.

A primary element in a fine arts community of international repute, the University of Iowa School of Music has long been recognized as one of the excellent university-based schools of music in the United States.

The School's on-campus enrollment of 600 students majoring in music is large enough to sustain strong programs in all areas of specialization, yet small enough to ensure the individual attention essential to each student's development.

The faculty consists of highly trained artist-teachers in each area of specialization. Faculty ensembles in residence include the Stradivari String Quartet, Iowa Woodwind Quintet, Iowa Brass Quintet, Percussion Quartet, Vocal Quartet and the Baroque Players. Private lessons with faculty members are offered in all band and orchestra instruments, voice, piano and organ.

At the undergraduate level, the School's curricula offer all qualified students an opportunity for the further study of music toward either professional or avocational goals. The graduate curricula are designed primarily as preparation for teaching in secondary schools, colleges and universities, and for careers in performance.

The School is a charter member of the National Association of Schools of Music.

Undergraduate Programs

The School offers two undergraduate degrees: the Bachelor of Arts and the Bachelor of Music. Curricula are the same for both, with these exceptions: candidates for the B.M. degree may, and candidates for the B.A. may not, count more than 50 semester hours of coursework in music toward the 124 semester hours required for graduation; and the foreign language requirement for the B.M. is one year of college-level study, while the requirement for the B.A. is two years. Areas of concentration offered in both programs are performance, music education, music therapy and composition/theory.

General Requirements

All undergraduate enrollments require School of Music approval. Entering undergraduate students planning to major in music are expected to audition either in person or by tape recording in advance of registration. All transfer students must also take the Advisory Examination in music theory (see "Graduate Degrees"). Any serious deficiencies in theory must be removed through registration in 25:11 Review Theory.

All baccalaureate candidates in music must satisfy all College of Liberal Arts general requirements except the historical-cultural core requirement (see the College of Liberal Arts section of the *Catalog* for these requirements), and the following requirements of the School:

25:1-2 Literature and Theory I-II	6 s.h.
25:3-4 Aural Skills I-II	2 s.h.
25:5-6 Literature and Theory III-IV	6 s.h.
25:7-8 Aural Skills III-IV	2 s.h.
25:91-92 History of Music I-II	6 s.h.
25:71-72 Group Instruction in Piano I-II	2 s.h.
or adequate proficiency	
25:85 Recital Attendance	0 s.h.
(required of wind, percussion, string, and voice majors for seven semesters)	
25:144 Senior Recital	0 s.h.

Four semester hours of electives from the following:

25:15 Undergraduate Composition	2 s.h.
One of these:	
25:117 Arranging for Band	2 s.h.
or	
25:118 Jazz Composition and Arranging	1-2 s.h.
or	
25:157 Orchestration	2 s.h.
25:145 Contrapuntal Forms	3 s.h.
25:147 Tonal Forms	3 s.h.
25:148 Analysis of Music Literature, 1600-1750	3 s.h.

25:149 Analysis of Music Literature, 1750-1825 3 s.h.
25:150 Analysis of Music Literature, 1825-1900 3 s.h.
25:151 Analysis of Music Literature, 1890-Present 3 s.h.
25:152 Analysis of Music Literature, Special Topics 3 s.h.
25:153 Thorough Bass Realization I 2 s.h.
25:212 Gregorian Chant 3 s.h.
25:215 Fugue 3 s.h.

Four years of applied music.

Four years of participation in band, orchestra or chorus. Ensemble assignments are made at the discretion of the adviser and the ensemble conductors. Keyboard majors may substitute accompanying in place of large ensemble participation for two semesters during their junior and/or senior year, with the consent of their adviser. Any requests for adjustment of the rules pertaining to performance in large ensembles must be submitted to a reviewing committee.

Advanced electives in performance (including chamber music and piano accompanying), theory, composition, music education, music history and literature, orchestration and conducting.

Music Education

Areas of concentration in music education are instrumental music, vocal music, music therapy. In addition to the B.A. or B.M. requirements in music and liberal arts, certification to teach music in Iowa schools requires satisfactory completion of specific requirements in the area of concentration. Requirements in the instrumental and vocal areas are listed below.

String Majors

Instruction in performance 2 s.h.
(Violin and viola majors take one year of 25:23 Cello; cello and bass majors take one year of 25:21 Violin .)
25:103 Class Strings 1-2 s.h.
(Violinists take viola and bass; violists take violin and bass; cellists take viola and bass; bassists take viola and cello.)
7S:143 Instrumental Techniques 2 s.h.
(normally clarinet and cornet)
25:107 Instrumental Conducting I 2 s.h.
25:108 Instrumental Conducting II 1 s.h.
7S:150 String Methods and Materials 3-4 s.h.
7E:144 Methods and Materials: Elementary School Instrumental Music 2 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School 6 s.h.
7E:192 Laboratory Practice in the Elementary School 6 s.h.
7S:187 Seminar: Curriculum and Student Teaching 1 s.h.

Brass, Woodwind or Percussion Majors

All brass, woodwind and percussion majors in the music education program must participate in concert band eight semesters, and in marching band for two fall semesters during the first two years in residence at the University. In the marching band program, students are assigned by the director of bands to either Section I—Football Marching Band or Section 2—Marching Band Techniques. Courses required:

Eight semester hours of 7S:143 Instrumental Techniques
25:107-108 Instrumental Conducting I-II 3 s.h.
7E:144 Methods and Materials: Elementary School Instrumental Music 2 s.h.
7S:138 Practicum Band Instrument Care and Repair 1 s.h.
7S:140 Band Methods and Materials 3 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School 6 s.h.
7E:192 Laboratory Practice in the Elementary School 6 s.h.
7S:187 Seminar: Curriculum and Student Teaching 1 s.h.

Vocal and Keyboard Majors

7S:147 Choral Methods and Conducting 3 s.h.
7S:148 Choral Literature and Conducting 3 s.h.
25:115-116 Diction for Singers I-II 4 s.h.
7E:145 Methods and Materials: Elementary School General Music 3 s.h.
7S:142 Methods and Materials: Secondary School General Music 3 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School 6 s.h.
7E:192 Laboratory Practice in the Elementary School 6 s.h.
7S:187 Seminar: Curriculum and Student Teaching 1 s.h.

Keyboard majors preparing for music teacher certification must pass the proficiency examination of 25:71-72 Group Instruction in Piano I-II. Keyboard majors lacking satisfactory competence in voice also must register for 25:17 Voice for two semesters.

Keyboard Majors—Nonvocal Area

Keyboard majors who elect to teach in the nonvocal area must complete the requirements in either the brass-woodwind-percussion or string areas, and pass the proficiency examination of 25:71-72 Group Instruction in Piano I-II.

Music Teaching Minor for Elementary Education Majors

A student qualifies for certification as an elementary school general music teacher by completing the approved certification program for elementary teachers and 22-23 semester hours as follows:

7E:119 Methods: Basic Skills and Techniques in Music Education 3 s.h.
7E:145 Methods and Materials: Elementary School General Music 3 s.h.
7E:192 Laboratory Practice in the Elementary School 2-3 s.h.
Applied music 2 s.h.
Ensemble (chorus, band, or orchestra) 2 s.h.
Music theory, literature, fundamentals (two of the following: 25:10, 25:1, 25:2) 6 s.h.
11:39-40 Masterpieces of Music 8 s.h.

A student who wishes to complete an area of specialization in music without teacher certification may substitute other courses for 7E:192 with the adviser's approval.

Music Therapy

Admission to the program in music therapy is based on (a) demonstrated minimum keyboard skills and (b) successful completion of the introductory course in music therapy (25:114). The number of students admitted to the program is limited by the types and amounts of clinical experience available on campus. In addition to the specific courses in music therapy listed below, specific courses are required in biology, sociology, abnormal psychology and social psychology. A six-month

internship in an approved off-campus clinical facility is required before the completion of the degree and certification as a registered music therapist (RMT). For greater job opportunities, students also are strongly encouraged to complete the music teacher certification requirements. Complete information on the program is available in the music education office. Course requirements:

25:96 Recreational Music Techniques	2 s.h.
25:114 Orientation to Music Therapy	2 s.h.
7S:144 Psychology of Music I	2 s.h.
7S:149 Laboratory: Psychology of Music	2 s.h.
25:138 Influence of Music on Behavior	2 s.h.
25:139 Principles and Procedures in Music Therapy	2 s.h.
25:140 Internship in Music Therapy	2 s.h.

Composition/Theory Major

Students are not admitted to this program earlier than the sophomore year. Upon application for admission to the program, the candidate shall be assigned a committee of three faculty members, in consultation with whom a course of study leading to the degree shall be determined. Admission is based on an evaluation of original compositions submitted to an admission and advisory committee; achievement in theory and composition courses; and keyboard competence, tested by an examination including sight reading (Bach chorale) and performance (Bach *Invention* or work of comparable difficulty).

Course requirements:

25:1-2 Literature and Theory I- II	6 s.h.
25:3-4 Aural Skills I-II	2 s.h.
25:5-6 Literature and Theory III-IV	6 s.h.
25:7-8 Aural Skills III-IV	2 s.h.
25:91-92 History of Music I-II	6 s.h.

Thesis Requirement

The thesis replaces the senior recital required of applied music majors, and consists of one or more original compositions, approved by the student's advisory committee and performed in regularly-scheduled School of Music recitals, and/or a committee-approved scholarly paper dealing with theoretical issues.

Applied Music Requirement

Until admitted to the program, the student must take private lessons on his or her major instrument or in voice. Following admission, the student undertakes applied music study as recommended by the advisory committee.

Ensemble Requirement

The candidate participates in an approved ensemble for four years.

Honors

A student with junior or senior standing may undertake Honors work in music with the approval of the director of the College of Liberal Arts Honors program, provided a School of Music faculty member sponsors the student in Honors status and the student has maintained a minimum grade-point average of 3.0 on all previous work undertaken at the University.

A student maintaining the minimum 3.0 average qualifies for graduation "with Honors" by completing satisfactorily from six to eight semester hours in 25:97 Honors in Music. Types of Honors projects for which credit is given in 25:97 are Honors performances, solo and/or ensemble; Honors compositions, orchestrations, arrangements; and Honors essays, research papers, editings, translations, etc.

A combination of at least two of these types of projects is required. None of the projects may duplicate projects assigned in other courses or required for graduation, such as 25:144 Senior Recital.

Honors students in music are encouraged to take graduate-level courses. Advanced coursework in music history, music theory and languages is particularly recommended. An Honors committee of at least three members is appointed by the Honors sponsor to evaluate the student's work.

Financial Aid

A number of Music Activity Scholarships are available to qualified undergraduate music majors. For information write the School of Music.

Graduate Programs

The entering graduate student must take the School of Music advisory examination in music theory (harmony, ear training, forms and counterpoint), and history and literature, before his or her first registration. The advisory examination is given each session on the two days (excluding Sunday) before Registration. A leaflet describing the general content of these tests may be obtained from the Director's Office, School of Music. (For general graduate admission, degree and examination requirements, see the "Graduate College" section of the *Catalog*).

Master of Arts

The Master of Arts with thesis is offered in the areas of performance (including conducting), composition, music theory, and music history and literature. The Master of Arts without thesis is offered in the areas of music education and instrumental or vocal pedagogy (including accompanying). Both require a minimum of 30 post-baccalaureate semester hours. Information about specific admission and curricular requirements for each is available from the School of Music. All curricula must include:

General

25:321 Introduction to Graduate Study in Music

25:145 Contrapuntal Forms
or
25:147 Tonal Forms

One elective in Analysis of Music Literature (25:148-152) or equivalent.

If excused from 25:145 or 25:147 as a result of the advisory examination, the student must take the other one and the Analysis of Music Literature elective; if excused from both 25:145 and 25:147, the student need take only the Analysis of Music Literature elective. Any serious music theory and ear training deficiencies revealed in the advisory examination are to be removed through 25:11 Review Theory.

Music History

25:301-302 Advanced History and Literature of Music I-II
or equivalent, or satisfactory advisory examination score.

If excused from 25:301 and/or 25:302 as a result of the advisory examination, the

student should elect another course from the music history sequence 25:303-314, 25:316-317. 25:323, 25:330-332 and other musicology courses may be elected in special cases, with permission of the musicology adviser.

Ensemble Participation

25:185 University Choir or Kantorei

25:191 Symphonic Choir
25:192 Orchestra
25:194 Symphony Band, Wind Ensemble, Concert Band

Keyboard majors may substitute accompaniment for participation in a large ensemble, at their advisers' discretion. Theory, composition, musicology and music education majors may, with their advisers' permission, substitute other ensembles. Voice majors, with their advisers' permission, may be excused from participation in large vocal ensembles during the period in which they are singing major roles in opera theater. Any requests for adjustment of this requirement must be submitted to a reviewing committee.

Electives

Suitable courses in the student's area of concentration.

Admission

Before an applicant will be considered for admission, he or she must have submitted supporting materials in his or her indicated area of concentration, as follows:
Composition—representative musical scores
Theory-analyses or commentaries on musical works
Music Education—no materials required
Performance (including conducting)—audition
Music History and Musicology—research papers
Pedagogy—contact School of Music

Information about specific admission and curricular requirements for each area is available from the Director's Office.

Master of Fine Arts

The M.F.A. is for students of superior ability in the areas of composition, instrumental or choral performance, conducting, and opera theater directing. It requires a minimum of 48 post-baccalaureate semester hours.

In addition to the entrance and curricular requirements for the Master of Arts degree, the student must also present at least two full-length recitals or programs (25:401 M.F.A. Thesis), for which a maximum of eight semester hours of credit will be granted. The student may earn a Master of Arts degree while working toward the Master of Fine Arts degree, but all requirements for each degree must be met separately, including two final examinations, with a minimum combined total of 60 semester hours of graduate credit. (See the "Graduate College" section of the *Catalog* for further details.)

Doctoral Degrees

General Requirements

All doctoral study in music includes:

Minimum course requirements listed under the M.A. degree
One or more additional electives from the analytical studies sequence 25:148-152 or equivalent
One or more additonal courses in the music history/musicology sequence indicated in the master's degree requirements
25:295 Physics of Sound and Music or equivalent
Reading proficiency in at least one foreign language (must be completed before comprehensive examination; music education students may substitute two courses in statistics for this requirement)
Dissertation

All doctoral students must be available for participation in a large ensemble (25:245 Opera Theater: Roles, 25:185 University Choir, 25:191 Symphonic Choir, 25:192 Orchestra, 25:194 Symphony Band, Wind Ensemble, Concert Band) during each term of registration unless excused by their advisers. Keyboard majors may substitute accompaniment in place of participation in a large ensemble, at the discretion of their adviser.

Doctor of Philosophy

Areas of concentration include composition, music history and musicology, music education, music theory and music literature.

The music literature program is designed for students who have already achieved a professional level of musical performance and who wish to broaden their background by intensive studies in music literature. An audition in the major performance area is a prerequisite.

Information about specific admission and curricular requirements for each area is available from the Director's Office.

Doctor of Musical Arts

Requirements for the D.M.A. degree in performance and pedagogy are the general doctoral requirements of the School, except that the D.M.A. dissertation consists of three full-length recitals or two recitals and a concerto performance with orchestra or other appropriate ensemble. Vocalists may substitute the execution of one or more major roles in a large-scale work for one of their recitals. Conductors will present two programs.

D.M.A. candidates must also give evidence of their ability to make a scholarly investigation of limited scope by means of a written essay.

Admission

Before an applicant will be considered for admission to a doctoral program, he or she must have submitted supporting materials in his or her indicated area of concentration, as follows:

Composition—representative musical scores
Theory—analyses or commentaries on musical works
Music Education—research papers
Music Literature—research papers and audition
Performance (including conducting)—audition
Music History and Musicology—research papers

Graduate Awards

Qualified graduate students are invited to apply for teaching and research assistantships. Inquiries should be directed to the School of Music.

Opportunities for Performance

The following organizations provide many performing opportunities for qualified students:

Camerata Singers
Old Gold Singers
Kantorei

University Choir
Symphonic Choir
Opera Theater
Collegium Musicum
Chamber Orchestra
Symphony Orchestra
Symphony Band
Wind Ensemble
Concert Band
Marching Band
Jazz Band
Percussion Ensemble
Scottish Highlanders

Music for Nonmajors

Students who are not majoring in music but have an avocational interest in it may find 25:159 Late 18th- and 19th-Century Composers, 25:160 Early 18th- and 20th-Century Composers or 11:39-40 Masterpieces of Music helpful in acquainting them with music as listeners. 25:230-231 World Music I-II is available for students interested in non-Western music. 25:10 Fundamentals of Music is for nonmajors who have little or no experience with notation, theory, and aural skills. With the instructor's approval, nonmajors with an elementary background in music may register for 25:1-2 Literature and Theory I-II. Nonmajors interested in performance should consult music advisers regarding appropriate courses in applied music (solo and ensemble).

Special Programs

The Center for New Music provides an environment for innovative composition and a vehicle for the performance of new works. Its repertoire includes the works of little-known young composers and works using electronic sounds, as well as compositions by recognized modern composers.

The Center for the New Performing Arts is an interdisciplinary unit linking the University's schools of Music and Art and its film, dance, theater and creative writing areas. The Center's basic purpose is to encourage talented young artists to develop their creative skills through multimedia and intermedia classes, projects and performances.

Facilities

With completion of the new Music Building (1971) and adjoining Hancher Auditorium (1972), the University of Iowa Center for the Arts has one of the nation's finest facilities for teaching and performance in music. In addition to class and seminar rooms, the Music Building includes 55 teaching studios, 73 practice rooms, a large library, two electronic music laboratories, soundproof ear-training and listening facilities with 50 listening posts, four large rehearsal halls, ample solo and ensemble practice facilities, professional recording facilities, eight practice and recital organs and the 720-seat Clapp Recital Hall. Hancher Auditorium seats 2,680 people for concerts, 2,400 for operas and other stage productions.

Library resources include more than 50,000 volumes of music and books—increasing at the rate of approximately 2,000 a year—and more than 2,100 reels of microfilm, a microcard file of approximately 300 titles, nearly 5,000 LP records and 175 periodicals in several languages. The acquisition program gives particular attention to a strong reference collection, emphasizing resources for musical research and performance. The library's quarters in the Music Building provide 24 study carrels, a microreader room, a typing room, a seminar and rare books room, a large reading area and a separate area for the Goldman Band Library, one of the world's most famous collections of band music.

Courses

Primarily for Undergraduates

Theory and Composition

25:1 Literature and Theory I 3 s.h.
Hearing, writing and singing skills; rudiments of music and fundamentals of harmony. Corequisite: 25:3.

25:2 Literature and Theory II 3 s.h.
Continuation of 25:1. Corequisite: 25:4.

25:3 Aural Skills I 1 s.h.

25:4 Aural Skills II 1 s.h.

25:5 Literature and Theory III 3 s.h.
Harmonic, contrapuntal and formal practices from 17th century to present. Prerequisites: 25:2, 25:4; corequisite: 25:7.

25:6 Literature and Theory IV 3 s.h.
Continuation of 25:5, which is prerequisite. Corequisite: 25:8.

25:7 Aural Skills III 1 s.h.

25:8 Aural Skills IV 1 s.h.

25:10 Fundamentals of Music 3 s.h.
Musical notation; elementary melodic, rhythmic and harmonic theory; basic aural skills; for students with little or no previous experience. Not open to music majors.

25:11 Review Theory arr.

25:15 Undergraduate Composition 2 s.h.
Prerequisite: 25:2.

History and Research

25:85 Recital Attendance 0 s.h.

25:91 History of Music I 3 s.h.
Prerequisites: music majors, 25:5 and 25:6 or equivalent; nonmajors, consent of instructor.

25:92 History of Music II 3 s.h.
Continuation of 25:91, but may be taken as independent unit. Prerequisite: same as for 25:91.

25:97 Honors in Music 1-4 s.h.
May be repeated for credit.

Courses for Undergraduates and Graduates

Music Education

Where dual numbers are indicated, students preparing for Music Teacher Certificate should register under education number.

25:71 Group Instruction in Piano I 1 s.h.
Beginning instruction for music majors whose principal performing medium is voice or an orchestral or band instrument; study includes development of skills in sight reading, technique, harmonization, transposition, improvisation and simple literature.

25:72 Group Instruction in Piano II 1 s.h.
Elementary to early intermediate instruction for music majors whose principal performing medium is voice or an orchestral or band instrument; continuation of skills introduced in 25:71; introduction of easy solo and ensemble literature. Prerequisite: 25:71 or successful proficiency examination.

25:96 Recreational Music Techniques 2 s.h.
Uses of music in group recreational activities; emphasis on musical accompaniment and leadership techniques.

25:103 Class Strings arr.
Open only to string majors for study of a secondary string instrument.

25:105 Instrumental Techniques 1-3 s.h.
For prospective teachers in public schools; fundamental skills in wind and percussion instruments. Same as 7S:143.

25:107 Instrumental Conducting I 2 s.h.

25:108 Instrumental Conducting II 1 s.h.
Prerequisite: 25:107 or consent of instructor.

25:109 Choral Methods and Conducting 3 s.h.
Same as 7S:147.

25:110 Choral Literature and Conducting 3 s.h.
Prerequisite: 25:109. Same as 7S:148.

25:111 Choral Techniques 2 s.h.

25:112 String Methods and Materials 3-4 s.h.
Same as 7S:150.

25:113 Methods of Teaching Piano 1-2 s.h.

25:114 Orientation to Music Therapy 2 s.h.
Supervised field experience designed to provide (a) an

orientation to various therapeutic centers, and (b) self-appraisal of the personal qualities needed in the therapeutic setting.

25:115 Diction for Singers I 2 s.h.
English and French.

25:116 Diction for Singers II 2 s.h.
German and Italian.

25:117 Arranging for Band 2 s.h.

25:138 Influence of Music on Behavior 2 s.h.
Review of the theoretical bases and experimental evidence of the influence of music on human behavior. Prerequisite: 7S:144, 7S:149 or approval of instructor.

25:139 Principles and Procedures in Music Therapy 2 s.h.
Procedures for the use of music in clinical settings, with specific emphasis on the patients or clients to be served. Prerequisite: 25:138, approval of instructor.

25:140 Internship in Music Therapy 2 s.h.
A six-month period of clinical training in an approved music therapy program under the direction of a registered music therapist.

25:143 Seminar: Percussion Methods, Materials, Performance Practices 1-2 s.h.
Contemporary percussion literature and current styles, notation, techniques of performance and composition. Prerequisite: consent of instructor.

25:155 Fundamentals of Music 3 s.h.

25:158 Advanced Conducting arr.
Prerequisite: elementary conducting skills.

25:211 Advanced String Methods and Literature 3 s.h.
Advanced pedagogy for orchestral stringed instruments. Open to undergraduates with consent of instructor.

25:214 Recording Techniques 3 s.h.
Prerequisite: consent of instructor.

25:221 Special Studies in Music Therapy 2-3 s.h.
Individual research on special problems in music therapy. May be repeated for credit. Prerequisite: consent of instructor.

Theory and Composition

25:106 History of Black Music 3 s.h.
Same as 45:130.

25:145 Contrapuntal Forms 3 s.h.
Writing and analysis. Prerequisite: 25:2, 25:11 or equivalent.

25:146 20th-Century Harmony and Counterpoint 3 s.h.
Lectures and writing. Prerequisite: 25:2, 25:11 or equivalent.

25:147 Tonal Forms 3 s.h.
Prerequisite: 25:2, 25:11 or equivalent.

25:148 Analysis of Music Literature, 1600-1750 3 s.h.
May be repeated. Second semester. Prerequisites: 25:11 or equivalent and 25:5 or equivalent.

25:149 Analysis of Music Literature, 1750-1825 3 s.h.
May be repeated. First semester. Prerequisites: 25:11 or equivalent and 25:5 or equivalent.

25:150 Analysis of Music Literature, 1825-1900 3 s.h.
May be repeated. Second semester. Prerequisites: 25:11 or equivalent and 25:5 or equivalent.

25:151 Analysis of Music Literature, 1890-Present 3 s.h.
May be repeated. Both semesters. Prerequisites: 25:11 or equivalent and 25:5 or equivalent.

25:152 Analysis of Music Literature, Special Topics arr.
Scope and content chosen by instructor.

25:153 Thorough Bass Realization I 1-2 s.h.
Applied study of thorough bass in 17th- and 18th-century music. Prerequisites: 25:6 and sufficient keyboard proficiency.

25:154 Thorough Bass Realization II 1-2 s.h.
Prerequisite: 25:153 or consent of instructor.

25:156 Composition Seminar 0-1 s.h.
Prerequisites: advanced standing and permission of instructor.

25:157 Orchestration 2 s.h.
Prerequisite: 25:6.

25:212 Gregorian Chant 3 s.h.
Performance practice and analysis of Gregorian chant; organization of Roman liturgy; some knowledge of Latin recommended.

25:215 Fugue 3 s.h.
Writing and analysis. Prerequisite: mastery of materials of counterpoint and harmony.

25:222 Variation Forms 3 s.h.
Writing and analysis.

25:223 Advanced Composition arr.
May be repeated for credit. Prerequisite: 25:15 or consent of instructor. Corequisite: 25:156.

History, Literature and Research

25:159 Late 18th- and 19th-Century Composers 3-4 s.h.

25:160 Early 18th- and 20th-Century Composers 3-4 s.h.

25:198 Organ Pedagogy 2 s.h.
Study of principles of organ teaching through examination of methods and literature appropriate for beginning, intermediate and advanced levels. Offered alternate years; offered 1978-79.

25:199 Special Studies arr.

25:213 Biblical Interpretation in Oratorio and Opera 3 s.h.
Interdisciplinary course in Music and Religion; chronological and comparative study of biblical oratorios and operas from the Baroque period to the present. Special attention to the manner in which librettists and composers interpret the biblical text, and to the contextual factors that have influenced these interpretations. Same as 33:170, 32:171.

25:216 Interpretation of German Art Song arr.

25:217 Interpretation of Non-German Art Song arr.

25:218 Art and Technology I 3 s.h.
Prerequisite: consent of instructor.

25:219 Art and Technology II 3 s.h.
Prerequisite: consent of instructor.

25:226 History of Organ Building and Design 2 s.h.
Development of organ building; history of actions and of stops from Renaissance to present; open to graduate students and to others by consent of instructor. May be repeated for credit. Offered alternate years; offered 1978-79.

25:227 Organ Improvisation and Liturgics I 2 s.h.
Improvisation of short two- and three-part hymn introductions. Historical and contemporary liturgies. May be repeated for credit. Offered in alternate years; in fall semester; offered 1979-80.

25:228 Organ Improvisation and Liturgics II 2 s.h.
May be repeated for credit. Offered in alternate years; offered 1977-78.

25:229 Organ Literature 2 s.h.
Survey of organ literature from 15th century to the present. Offered 1979-80. Alternate years special topics. Open to advanced undergraduate and graduate students. May be repeated for credit.

25:230 World Music I 3 s.h.
Introduction to the music of the indigenous peoples of sub-Saharan Africa, the Americas, Australia and Oceania. Open to undergraduate majors and nonmajors.

25:231 World Music II 3 s.h.
Musical styles of India, China, Korea, Japan, Indonesia, Iran and the Arab countries. Open to undergraduate majors and nonmajors.

25:290 Vocal Literature arr.

25:291 Orchestral Literature arr.

25:292 Piano Literature arr.

25:293 String Instrument Literature arr.

25:294 Wind Instrument Literature arr.

25:295 Physics of Sound and Music 3 s.h.
Same as 29:113.

Jazz Studies

25:101 Jazz Improvisation I 2 s.h.
Prerequisite: 25:1 or consent of instructor.

25:102 Jazz Improvisation II 2 s.h.
Prerequisite: 25:101 or consent of instructor.

25:118 Jazz Composition and Arranging 1-2 s.h.
Prerequisite: 25:6. Corequisite: 25:196.

25:141 History of Jazz 2 s.h.
Spring semester only. Prerequisite: 25:5 or equivalent.

25:196 Jazz Band Techniques 1 s.h.
For music education majors.

25:197 Jazz Band arr.
Prerequisite: consent of instructor.

25:224 Small Jazz Ensembles 1 s.h.
Prerequisite: 25:102 or consent of instructor.

Courses Primarily for Graduates

Music Education

25:200 Seminar: Band Problems arr.

25:201 Methods of Teaching Voice I 3 s.h.

25:202 Methods of Teaching Voice II 3 s.h.

25:203 Advanced Choral Conducting I 3 s.h.
Literature, style, related techniques and methods in rehearsing music from Gregorian chant through Bach. Corequisite: 25:261.

25:204 Advanced Choral Conducting II 3 s.h.
Style and technique dealing with music from Rococo through contemporary. Corequisite: 25:262.

25:205 Advanced Choral Conducting III 3 s.h.
Choral works from the Renaissance. Corequisite: 25:341.

25:206 Advanced Choral Conducting IV 3 s.h.
Choral works from the Baroque. Corequisite: 25:342.

25:207 Advanced Choral Conducting V 3 s.h.
Choral works of the Classic-Romantic period. Corequisite: 25:343.

25:208 Advanced Choral Conducting VI 3 s.h.
Contemporary choral works. Corequisite: 25:344.

25:209 Advanced Instrumental Methods and Literature I 2-3 s.h.
Review of techniques, solo, ensemble and study material for wind and percussion instruments.

25:210 Advanced Instrumental Methods and Literature II 2-3 s.h.

25:220 Instrumental Music Workshop 1-2 s.h.
Same as 7S:241.

25:225 Score Reading 1 s.h.

25:232 Teaching Methods in Group Piano Instruction 2 s.h.
Techniques, methods, materials, observations, supervised teaching experience.

25:280 Brass Pedagogy arr.
Survey of teaching techniques applicable to brass instruction. Undergraduates accepted only with consent of instructor.

25:299 Seminar: Contemporary Issues in Music Education arr.
Same as 7S:141.

Theory and Composition

25:234 Practice Teaching in Theory arr.

25:236 Methods and Techniques of Teaching Basic Musicianship arr.
Techniques for teaching basic theory skills, interval, rhythmic, melodic, harmonic dictation and selected keyboard skills.

25:237 Seminar: Music Theory Research arr.

25:241 History of Music Theory I 2 s.h.

25:242 History of Music Theory II 2 s.h.

25:250 Electronic Studio I arr.
Nature, care and use of equipment in electronic music studio. Prerequisite: 25:15 or consent of instructor.

25:251 Electronic Studio II arr.
Individual creative studies. May be repeated for credit. Prerequisites: 25:250 and consent of instructor.

Musicology, Literature and Research

25:255 Haydn Performance Seminar 1-3 s.h.
Summer program held in Vienna.

25:261 Advanced Choral Literature I 3 s.h.
Choral music from Gregorian chant through Bach.

25:262 Advanced Choral Literature II 3 s.h.
Choral music from Rococo through contemporary.

25:271 Studies in Church Music arr.
Individualized projects in selected areas of church music: liturgies, hymnody, church choir repertory, religion and the arts.

25:301 Advanced History and Literature of Music I 3 s.h.
Style in Western music.

25:302 Advanced History and Literature of Music II 3 s.h.
Continuation of 25:301, but may be taken as independent unit with permission of instructor.
(Note: 25:303-25:314 are a series of intensive surveys of special areas in the history of music, with detailed analysis of representative works. Offered in rotation approximately every year or two. Content of 25:313 and 25:314 differs each time, and these courses may be repeated for credit.)

25:303 Medieval Music 3 s.h.

25:304 Renaissance Music 3 s.h.

25:305 17th-Century Music 3 s.h.

25:306 Age of Bach and Handel 3 s.h.

25:307 The Classical Period 3 s.h.

25:308 19th-Century Music 3 s.h.

25:309 20th-Century Music I: to WW II 3 s.h.

25:310 20th-Century Music II: Since WW II 3 s.h.

25:311 Music of the Americas I: U.S. and Canada 3 s.h.

25:312 Music of the Americas: Latin America 3 s.h.

25:313 Major Composers 3 s.h.

25:314 Genres of Music 3 s.h.

25:316 The History of Musical Instruments 3 s.h.
Classification and world-wide varieties of musical instruments, and history of instruments in the West.

25:317 Principles of Construction and Maintenance of Historical Instruments 3 s.h.
Acoustics, tuning, maintenance and repair of historical instruments.

25:321 Introduction to Graduate Study in Music 2 s.h.
Use of the music library: reference materials; bibliography; research problems and methods, with guest lecturers from various musical subject areas; required of all graduate students.

25:322 Advanced Bibliography and Reference Materials 4 s.h.
Intensive bibliography, including additional materials in student's major field of concentration. Prerequisite: 25:321 or consent of instructor.

25:323 Historical Music Notations 1-2 s.h.
Musical paleography; transcription and stylistic study of early vocal and instrumental notations and tablatures. May be repeated for credit.

25:330 Seminar in Musicology 2-3 s.h.
Bibliographical materials, library resources, style analysis and criticism and related fields; study of special topics in groups and by individual investigation. May be repeated for credit. Prerequisite: consent of instructor.

25:331 Performance Practices I: Medieval and Renaissance Music 3 s.h.
Problems of interpretation in early music.

25:332 Performance Practices II: 17th- and 18th-Century Music 3 s.h.
Interpretation aspects of music of Baroque and Classical periods.

25:333 Seminar: Collegium Musicum Administration 1-2 s.h.

25:335 Seminar: Wind Instrument Performance arr.

25:337 Music Research and the Computer 3 s.h.
Current applications of high-speed digital computers to research in music theory, history and composition.

25:339 Seminar: Operatic Literature arr.
A study in detail of most important operatic scores from standpoint of performers, directors and production problems.

25:340 Seminar: Brass Instrument Performance arr.

25:341 Seminar: Choral Literature and Analysis III 3 s.h.
Choral works from the Renaissance.

25:342 Seminar: Choral Literature and Analysis IV 3 s.h.
Choral works of the Baroque.

25:343 Seminar: Choral Literature and Analysis V 3 s.h.
Choral works of the Classic-Romantic period.

25:344 Seminar: Choral Literature and Analysis VI 3 s.h.
Contemporary choral works.

25:351 Survey of Song Literature I 2 s.h.
Solo song before Schubert.

25:352 Survey of Song Literature II 2 s.h.
German art song from Schubert to present.

25:353 Survey of Song Literature III 2 s.h.
Nineteenth- and 20th-century English, French, Italian, Scandinavian, Spanish and Russian songs.

25:354 Survey of Song Literature IV 2 s.h.
Contemporary American songs.

25:361 Special Studies Piano Literature arr.
Individual research in special aspects of piano literature; primarily for D.M.A. students. May be repeated for credit.

25:380 Readings in Music Theory arr.

25:381 Readings in Music History arr.

25:390 M.A. Performance Project arr.

Thesis

25:400 M.A. Thesis arr.

25:401 M.F.A. Thesis arr.

25:500 Ph.D. Thesis arr.

25:501 Composition Ph.D. Thesis arr.

25:502 D.M.A. Essay arr.

25:503 D.M.A. Recital arr.

Music Education

Music education courses are offered by the divisions of Elementary Education and Secondary Education in the College of Education. See those sections of the *Catalog* for listings and descriptions.

Applied Music

A fee of $50 per semester is charged for each applied music course in the student's major field of performance. Courses consist of individual or a combination of individual and class lessons, at the option of the instructor. Lessons are a minimum of one hour per week. Students electing two applied music courses in the same semester are assessed a $90 fee. All music majors are expected to attend seminars of the applied music courses for which they register.

Students not majoring in piano may register for only 25:18 or for 25:120. Nonmajors must have had at least two years of previous piano instruction to register for applied piano.

25:40 Voice	arr.
25:41 Piano	arr.
25:42 Organ	arr.
25:43 Harp	arr.
25:44 Violin	arr.
25:45 Viola	arr.
25:46 Cello	arr.
25:47 String bass	arr.
25:48 Flute	arr.
25:49 Oboe	arr.
25:50 Clarinet	arr.
25:51 Bassoon	arr.
25:52 Saxophone	arr.
25:53 French horn	arr.
25:54 Trumpet	arr.
25:55 Euphonium	arr.
25:56 Trombone	arr.
25:57 Tuba	arr.
25:58 Percussion	arr.
25:144 Senior Recital	0 s.h.
25:161 Voice	arr.
25:162 Piano	arr.
25:163 Harpsichord	arr.
25:164 Organ	arr.
25:165 Harp	arr.
25:166 Violin	arr.
25:167 Viola	arr.
25:168 Cello	arr.
25:169 String bass	arr.
25:170 Flute	arr.
25:171 Oboe	arr.
25:172 Clarinet	arr.
25:173 Bassoon	arr.
25:174 Saxophone	arr.
25:175 French horn	arr.
25:176 Trumpet	arr.
25:177 Euphonium	arr.
25:178 Trombone	arr.
25:179 Tuba	arr.
25:180 Percussion	arr.

Minor Field (open to nonmajors)

Instruction in the student's minor field of performance or for nonmusic majors is offered for a fee of $35 per course per semester. A course consists of one half-hour lesson or two hours of class instruction weekly, at option of instructor.

25:17 Voice	0-1 s.h.
25:18 Piano	0-1 s.h.
25:19 Organ	0-1 s.h.
25:20 Harp	0-1 s.h.
25:21 Violin	0-1 s.h.
25:22 Viola	0-1 s.h.
25:23 Cello	0-1 s.h.
25:24 String bass	0-1 s.h.
25:25 Flute	0-1 s.h.
25:26 Oboe	0-1 s.h.
25:27 Clarinet	0-1 s.h.
25:28 Bassoon	0-1 s.h.
25:29 Saxophone	0-1 s.h.
25:30 French horn	0-1 s.h.
25:31 Trumpet	0-1 s.h.
25:32 Euphonium	0-1 s.h.
25:33 Trombone	0-1 s.h.
25:34 Tuba	0-1 s.h.
25:35 Percussion	0-1 s.h.
25:119 Voice	1 s.h.
25:120 Piano	1 s.h.
25:121 Organ	1 s.h.
25:122 Harpsichord	1 s.h.
25:123 Violin	1 s.h.
25:124 Viola	1 s.h.
25:125 Cello	1 s.h.
25:126 String bass	1 s.h.
25:127 Flute	1 s.h.
25:128 Oboe	1 s.h.
25:129 Clarinet	1 s.h.
25:130 Bassoon	1 s.h.
25:131 Saxophone	1 s.h.
25:132 French horn	1 s.h.
25:133 Trumpet	1 s.h.
25:134 Euphonium	1 s.h.
25:135 Trombone	1 s.h.
25:136 Tuba	1 s.h.
25:137 Percussion	1 s.h.

Ensemble

No fee is charged for ensemble courses. Courses may be repeated for credit. Prerequisite for each: consent of instructor.

25:95 Scottish Highlanders	0-1 s.h.
25:104 Solo Roles	arr.
25:142 Camerata Singers	1 s.h.
25:181 Old Gold Singers	0-2 s.h.
25:182 Multimedia III Same as 1J:101.	3 s.h.
25:183 Chamber Orchestra	arr.
25:184 Collegium Musicum	arr.
25:185 University Choir	arr.
25:186 Piano Accompaniment	arr.
25:187 Piano Chamber Music	arr.
25:188 String Chamber Music	arr.
25:189 Woodwind Chamber Music	arr.
25:190 Brass Chamber Music	arr.
25:191 Symphonic Choir	arr.
25:192 Orchestra	arr.
25:193 Marching Band	arr.
25:194 Symphony Band, Wind Ensemble, Concert Band	arr.
25:195 Percussion Ensemble	arr.
25:245 Opera Theater: Roles Opera performance in both laboratory and full production situations.	arr.
25:246 Opera Theater: Chorus Study of opera chorus roles from vocal and dramatic standpoint.	arr.
25:247 Opera Theater Production Experience in technical theater (costume or scene shops).	1 s.h.
25:248 Opera Theater: Directing Seminar Experience in directing scenes and/or one-act operas.	arr.

Nuclear Medicine Technology

See "College of Medicine."

Nuclear Science and Technology

See "College of Medicine."

Philosophy

Department chair: Laird Addis
Faculty: *professors* Laird Addis, May Brodbeck, Panayot Butchvarov, Phillip Cummins, Moltke S. Gram
professor emeritus Gustav Bergmann
associate professor James Duerlinger
assistant professors Evan Fales, Richard Fumerton, Jack Temkin
Degrees offered: B.A., M.A., Ph.D.

Undergraduate Program

The undergraduate program in philosophy provides knowledge of the basic issues and the main developments in Western philosophy, and strengthens logical skills which are useful in a wide variety of fields. A major in philosophy can provide preparation for the advanced studies necessary for a career in religion or law, for example, as well as for positions in government and business which require a general education and a capacity for clear and systematic thinking. Advanced degree work is necessary for college teaching positions in philosophy.

Undergraduate majors are required to take at least 27 semester hours of courses numbered from 26:101 to 26:190, including: 26:103 Introduction to Logic

26:111 Ancient Philosophy
26:113 Early Modern Philosophy

Honors Program

The Department administers an Honors program for undergraduate majors of superior ability. To be eligible for the program, a student must have a cumulative grade-point average of at least 3.0. An individualized Honors program is developed by the student in consultation with his or her adviser in the Department. A student eligible for and interested in the program should consult with his or her adviser as early as possible, preferably in the sophomore year.

Graduate Program

The graduate program in philosophy is designed to train future teachers and scholars in philosophy. The main areas in the graduate curriculum are metaphysics and epistemology, history of philosophy, ethics, logic and philosophy of science.

Master of Arts

The Master of Arts degree requires a minimum of 30 semester hours and may be taken without thesis. Requirements include passing, at a high level of performance, courses in metaphysics and epistemology, history of philosophy, logic and philosophy of science, and ethics. In addition, the student must pass an oral final examination. There is no foreign language requirement.

Doctor of Philosophy

Candidacy for the doctoral program is formally determined by a vote of the faculty, usually after the completion of three semesters of graduate study. Requirements include passing, at a high level of performance, courses in metaphysics and epistemology, history of philosophy, logic and philosophy of science, and ethics. In addition, the student must pass a written comprehensive examination consisting of a dissertation area examination, a special area examination and a prospectus of the dissertation. Before taking the comprehensive examination, the student must show competence in French, German, Greek or Latin. The fourth year of graduate study is ordinarily spent in writing the doctoral dissertation.

Courses

Undergraduates Only

26:1 Problems of Moral Reasoning 2 s.h.
Philosophical study of ethical theories and their relation to decision making.

26:2 Problems of Logical Reasoning 2 s.h.
Philosophical study of correct and incorrect reasoning.

26:3 Problems of Political Philosophy 2 s.h.
Philosophical study of the good society and the relation of the individual to the state.

26:4 Problems of Mind and Matter 2 s.h.
Philosophical study of certain problems of reality and knowledge.

26:33 Philosophies of Man 4 s.h.
Fall. Discussion of recent theories of human nature and society, knowledge and human ideas, reality, and the universe. May be taken before or after 26:34. Same as 11:33.

26:34 Philosophies of Man 4 s.h.
Spring. Discussion of classical theories of human nature and society, knowledge and human ideas, reality, and the universe. May be taken before or after 26:33. Same as 11:34.

Undergraduates and Graduates

26:101 Introduction to Philosophy 3 s.h.
Analytical and historical introduction stressing fundamental issues and arguments.

26:102 Introduction to Ethics 3 s.h.
Analytical and historical introduction to ethical theory.

26:103 Introduction to Logic 3 s.h.
Main ideas and basic techniques of modern logic.

26:104 Introduction to Philosophy of Science 3 s.h.
Main issues in contemporary philosophy of science.

26:109 Undergraduate Seminar 3 s.h.
Intensive small-group discussion of selected philosophical problems. Same as 14:198.

26:111 Ancient Philosophy 3 s.h.
Main trends and major figures such as Plato and Aristotle.

26:112 Medieval Philosophy 3 s.h.
Main trends and major figures such as Augustine and Aquinas.

26:113 Early Modern Philosophy 3 s.h.
Main trends and major figures from Descartes to Kant.

26:114 Nineteenth Century Philosophy 3 s.h.
Main trends and major figures of 19th century philosophy.

26:115 Recent and Contemporary Philosophy 3 s.h.
Main trends and major figures of 20th century analytic philosophy.

26:125 American Philosophy 3 s.h.
Main trends and major figures such as James and Dewey.

26:131 Aesthetics 3 s.h.
Major problems in philosophy of the arts.

26:132 Political Philosophy 3 s.h.
Major problems in political philosophy.

26:133 Philosophy of History 3 s.h.
Major problems in philosophy of history.

26:134 Philosophy of Religion 3 s.h.
Major problems in philosophy of religion.

26:136 Philosophy of Literature 3 s.h.
Philosophical study of the foundations of literary criticism.

26:141 Existentialist Philosophy 3 s.h.
Main ideas of existentialism stressing Kierkegaard, Nietzsche and Sartre.

26:145 Buddhist Philosophy 3 s.h.
An introduction to the basic ideas of the four major schools of Buddhist philosophy.

26:161 Metaphysics 3 s.h.
Selected problems in contemporary metaphysics. Prerequisite: consent of instructor.

26:162 Epistemology 3 s.h.
Selected problems in contemporary epistemology. Prerequisite: consent of instructor.

26:163 Philosophy of Language 3 s.h.
Selected topics in contemporary philosophy of language. Prerequisite: consent of instructor. Same as 103:163.

26:164 Philosophy of Mind 3 s.h.
Selected topics in contemporary philosophy of mind. Prerequisite: consent of instructor.

26:165 Analytic Ethics 3 s.h.
Selected topics in contemporary ethics. Prerequisite: consent of instructor.

26:167 Modal Logic 3 s.h.
Techniques of modal logic developed and applied to issues in linguistic analysis and in modal semantics. Prerequisite: consent of instructor.

26:168 History of Ethics 3 s.h.
Selected topics in history of philosophical ethics. Prerequisite: consent of instructor.

26:169 Topics in Philosophy 3 s.h.
Intensive study of a single philosopher or problem. Prerequisite: consent of instructor.

26:170 Socrates and His Predecessors 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:111 or consent of instructor.

26:171 Plato 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:111 or consent of instructor.

26:172 Aristotle 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:111 or consent of instructor.

26:173 Later Greek Philosophy 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:111 or consent of instructor.

26:175 Aquinas, Scotus, Ockham 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:112 or consent of instructor.

26:177 Descartes 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:113 or consent of instructor.

26:178 Spinoza and Leibniz 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:113 or consent of instructor.

26:179 Locke 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:113 or consent of instructor.

26:180 Berkeley 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:113 or consent of instructor.

26:181 Hume 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:113 or consent of instructor.

26:185 Kant I 3 s.h.
Analysis of main ideas and major texts of Kant's metaphysics and epistemology. Prerequisite: 26:113 or consent of instructor.

26:186 Kant II 3 s.h.
Analysis of main ideas and major texts of Kant's ethics and aesthetics. Prerequisite: 26:113 or consent of instructor.

26:187 Fichte, Schelling, Hegel 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:113 or consent of instructor.

26:189 Brentano, Meinong and Husserl 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:113 or consent of instructor.

26:190 Wittgenstein 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:115 or consent of instructor.

26:199 Honors in Philosophy arr.
May be repeated to a maximum of 6 s.h.

Primarily for Graduates

26:201 Mathematical Logic 3 s.h.
Main ideas and techniques of mathematical logic. Open to undergraduates with consent of instructor.

26:203 Philosophical Problems of the Social Sciences 3 s.h.
Explanation and understanding, theories and reduction, values and ideology, freedom and causality. Open to undergraduates with consent of instructor. Same as 31:234.

26:209 Philosophy of Science 3 s.h.
Major topics in the philosophy of science. Open to undergraduates with consent of instructor.

26:221 Seminar: Metaphysics 3 s.h.
May be repeated for credit.

26:222 Seminar: Epistemology 3 s.h.
May be repeated for credit.

26:223 Seminar: Philosophical Analysis 3 s.h.
May be repeated for credit.

26:224 Seminar: Philosophy of Logic 3 s.h.
May be repeated for credit.

26:225 Seminar: Philosophy of Science 3 s.h.
May be repeated for credit.

26:226 Seminar: Ethics 3 s.h.
May be repeated for credit.

26:227 Seminar: History of Philosophy 3 s.h.
May be repeated for credit.

26:245 Research: Value Theory arr.
May be repeated for credit.

26:247 Research: Metaphysics and Epistemology arr.
May be repeated for credit.

26:249 Research: Logic and Philosophy of Science arr.
May be repeated for credit.

26:251 Research: History of Philosophy arr.
May be repeated for credit.

26:253 Thesis arr.
May be repeated for credit.

Physical Education

The University offers instruction in physical education on the west campus (Field House) and on the east campus (Halsey Gymnasium). The Department on the west campus was formerly called the Department of Physical Education for Men and the Department on the east campus, Department of Physical Education for Women.

Physical Education—Field House

Head: Louis E. Alley
Faculty: *professors* Louis E. Alley, Gene M. Asprey, Donald R. Casady, Charles M. Tipton
associate professors Carl V. Gisolfi, Gary F. Hansen, James G. Hay, N. Richard Holzaepfel, David K. Leslie, Jerry A. Maynard
associate professors emeriti David Armbruster, Donald D. Klotz, Dave McCuskey, Arthur J. Wendler
assistant professors Robert H. Allen, J.A. Scott Kelso
instructor Holly E. Wilson
assistants in teaching Duane D. Banks, F. X. Cretzmeyer, Edward T. Crowley, Danny T. Foster, Nancy Luckel Fraga, Dan M. Gable, James M. Roaborough, Warren G. Slebos, Bernard Wyatt
lecturers Hilary W. Hay, Robert K. Martin
Degrees offered: B.A., B.S., M.A., Ph.D.

Undergraduate Programs

Preparation for Teaching and Coaching

The Bachelor of Science degree program in teaching and coaching prepares students for teaching physical education and related subjects in elementary and secondary schools, and for coaching athletic teams. Though the recent job shortage in teaching and coaching has led to a high level of competition among applicants for teaching positions, graduates in physical education from this Department have had a high percentage of placement.

Program requirements:

27:11 Introduction to Physical Education	0 s.h.
27:21-22 Teaching of Recreational Sports I-II	4 s.h.
27:31 Teaching of Gymnastics	2 s.h.

One of these seven coaching courses:

27:32 Coaching of Gymnastics	2 s.h.
27:33 Coaching of Football	2 s.h.
27:34 Coaching of Baseball	2 s.h.
27:35 Coaching of Track and Field Athletics	2 s.h.
27:36 Coaching of Basketball	2 s.h.
27:38 Coaching of Competitive Swimming	2 s.h.
27:39 Coaching of Wrestling	2 s.h.
27:37 Teaching of Swimming	2 s.h.
27:53 Human Anatomy	2 s.h.
27:56 First Aid	0 s.h.
27:57 Introduction to Athletic Training	2 s.h.
27:103 Administration of Physical Education and Athletics	2-3 s.h.
27:105 Adapted Physical Education	2 s.h.
27:107 Biomechanics of Physical Education	3 s.h.
27:108 Introduction to Human Perceptual-Motor Performance	3 s.h.
27:141 Elementary Exercise Physiology	2 s.h.
72:13 Introduction to Human Physiology	4 s.h.
28:142 Contemporary Issues of Health Education	3 s.h.

Required for certification in physical education:

7E:71-72 Methods and Materials in Elementary School Physical Education	4 s.h.
or	
27:20 Social Forms of Dance	1-2 s.h.
7P:75 Educational Psychology and Measurement	3 s.h.
7S:91 Pre-Education Practicum	1-2 s.h.
7S:100 Introduction to Secondary School Teaching	2 s.h.
7S:145 Methods in Secondary Physical Education	3 s.h.
7S:187 Seminar: Curriculum and Student Teaching	1-3 s.h.
7S:190 Individual Projects in Lab Practice	1-3 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	arr.
7E:192 Laboratory Practice in Elementary School	arr.

Predoctoral Program

The predoctoral Bachelor of Arts program, which is open only to students with superior academic records, is designed to prepare students for graduate work in physical education with emphasis on exercise physiology, adapted physical education, anatomy, biomechanics or evaluation and statistics. The curriculum consists of a core of courses in physical education, and selected courses in mathematics, the biological sciences and the physical sciences, which are basic to advanced study in the area in which the student is interested. Because the student need not meet certification requirements for teaching in the public schools, this curriculum offers considerable latitude in the choice of electives to fit individual interests and needs.

Foundation courses required:

4:13-14 Principles of Chemistry I-II 6 s.h.
4:16 Elementary Chemistry Laboratory I 2 s.h.
4:121 Organic Chemistry I 3 s.h.
22M:2-3 Mathematical Techniques I-II 6 s.h.
22M:20 Elementary Functions 3 s.h.
29:11-12 College Physics 8 s.h.

Required professional courses in physical education and related areas:

27:11 Introduction to Physical Education 0 s.h.
27:21-22 Teaching of Recreational Sports I-II 4 s.h.
27:53 Human Anatomy 2 s.h.
27:97 Leadership Training I 1 s.h.
27:105 Adapted Physical Education 2 s.h.
7P:75 Educational Psychology and Measurement 3 s.h.
7S:145 Methods in Secondary Physical Education 3 s.h.
72:13 Introduction to Human Physiology 4 s.h.
72:202 Exercise Physiology 2 s.h.
72:311 Special Topics 2 s.h.
99:120 The Chemistry of Biological Materials 3 s.h.
99:130 Metabolism 3 s.h.

Endorsement for Coaching

The State Department of Public Instruction has provided for the endorsement of certified teachers for the coaching of athletic teams in schools. This endorsement is intended for teachers with majors in subjects other than physical education but who wish to coach interscholastic athletic teams. The endorsement does *not* permit the teacher to teach physical education classes in the schools.

Certification for coaching athletic teams at the junior high and secondary school levels requires satisfactory completion of the following courses:

27:53 Human Anatomy 2 s.h.
27:56 First Aid 0 s.h.
27:57 Introduction to Athletic Training 2 s.h.
Coaching of sport of interest
27:103 Administration of Physical Education and Athletics 2-3 s.h.
27:107 Biomechanics of Physical Education 3 s.h.
27:108 Introduction to Human Perceptual-Motor Performance 3 s.h.
27:141 Elementary Exercise Physiology 2 s.h.
*7S:192 Observation and Laboratory Practice in the Secondary School arr.

*May be waived on the basis of appropriate coaching experience.

Endorsement for Athletic Trainers

This endorsement is provided for students who want to be certified as trainers for athletic teams at either the secondary school level as a part of their regular teaching duties, or the college and university level. The courses required are designed to meet the standards for certification by the National Athletic Trainers Association and include:

17:41 Food Nutrition and Man 3 s.h.
or
17:142 Nutrition 3 s.h.
31:1 Elementary Psychology 4 s.h.
7P:75 Educational Psychology and Measurement 3 s.h.
72:13 Introduction to Human Physiology 4 s.h.
28:142 Contemporary Issues of Health Education 3 s.h.
27:53 Human Anatomy 2 s.h.
27:56 First Aid 0 s.h.
27:57 Introduction to Athletic Training 2 s.h.
27:105 Adapted Physical Education 2 s.h.
27:107 Biomechanics of Physical Education 3 s.h.
27:141 Elementary Exercise Physiology 2 s.h.
27:171 Medical Supervision of Athletics 2-3 s.h.
27:182 Evaluative Techniques in Athletic Training 2 s.h.
27:183 Athletic Training Modalities and Therapeutics 2 s.h.
27:184 Laboratory Practice in Athletic Training 2 s.h.

Pre-Physical Therapy Program

The pre-physical therapy program capitalizes on a unique juxtaposition of resources at Iowa. Within a six-block radius are located the Field House (which houses this Department), the College of Medicine, the University Hospitals, the Veterans Hospital, the Psychiatric Hospital and the University Hospital School for handicapped and mentally retarded children.

The proximity of these facilities, together with the close working relationships between the faculty of this Department and the faculties of various departments in the College of Medicine, offer an ideal setting for a pre-physical therapy program. Because there is a rapidly increasing demand for physical therapists who are willing to serve as athletic trainers for school, college, and university teams, the pre-physical therapy program in physical education renders a valuable service to schools and colleges, as well as to the paramedical aspects of physical therapy.

Students who wish to complete the requirements for admission to the training program in physical therapy must complete the following courses:

27:21-22 Teaching of Recreational Sports I-II 4 s.h.
27:31 Teaching of Gymnastics 2 s.h.
27:37 Teaching of Swimming 2 s.h.
27:53 Human Anatomy 2 s.h.
27:56 First Aid 0 s.h.
27:57 Introduction to Athletic Training 2 s.h.
27:58-59 Practicum in Special Physical Education 6 s.h.
27:103 Administration of Physical Education and Athletics 2-3 s.h.
27:105 Adapted Physical Education 2 s.h.
27:107 Biomechanics of Physical Education 3 s.h.
27:108 Introduction to Human Perceptual-Motor Performance 3 s.h.
27:141 Elementary Exercise Physiology 2 s.h.
27:153 Advanced Anatomy and Kinesiology 2-3, 5 s.h.
4:13-14 Principles of Chemistry I-II 6 s.h.
4:16 Elementary Chemistry Laboratory I 2 s.h.
7P:75 Educational Psychology and Measurement 3 s.h.
29:11-12 College Physics 8 s.h.
31:1 Elementary Psychology 4 s.h.
31:13 Psychology of Adjustment 3 s.h.
or
31:163 Abnormal Psychology 3 s.h.
37:3 Principles of Animal Biology 5 s.h.
37:81 Principles of Human Genetics 4 s.h.
37:103 Comparative Vertebrate Anatomy 4 s.h.
28:142 Contemporary Issues of Health Education 3 s.h.
72:13 Introduction to Human Physiology 4 s.h.
A course in mathematics

Graduate Programs

M.A. without Thesis

The program leading to the M.A. degree without thesis is designed as a terminal unit of advanced study for teachers of basic physical education and for athletics coaches. Emphasis is placed on the application of research findings to the organization, teaching and evaluation of basic physical education programs for all students in schools and colleges, and to the coaching of interscholastic and intercollegiate athletic teams. Particular attention is given to problems associated with teaching and coaching in public schools and community colleges in Iowa. The placement of graduates with the M.A. degree without thesis has been excellent.

Undergraduate Prerequisites

The undergraduate coursework listed below is required. Any or all of this coursework may be taken after the student has been admitted to graduate study, but it should be taken at the earliest opportunity.

Human anatomy	2 s.h.
Human physiology	3 s.h.
Personal hygiene (or equivalent)	2 s.h.
Administration of physical education and athletics	2 s.h.
Methods in physical education	2 s.h.
Practice teaching (or equivalent)	3 s.h.
Teaching of gymnastics	1 s.h.
Teaching of swimming	1 s.h.
Coaching (one sport)	1 s.h.
Electives in physical education and related areas	13 s.h.
Total	30 s.h.

Credit may be given for experience and competence in techniques when such competence is demonstrated by examination.

Graduate requirements

For the M.A. degree without thesis, the student must complete a minimum of 30 semester hours, at least 24 of which must be in physical education, including 27:301 Non-thesis Seminar. At least one course must be selected from each of these three groups:

Group I

27:105 Adapted Physical Education (may not be elected if student has completed equivalent course in undergraduate study)	2 s.h.
27:167 Measurement and Evaluation in Physical Education	3 s.h.

Group II

27:242 Supervision of Physical Education	3 s.h.
27:237 Public School Curriculum in Physical Education	3 s.h.
27:308 Human Perceptual-Motor Performance	3-4 s.h.

Group III

27:157 Biomechanics of Athletics	3 s.h.
27:241 Scientific Principles of Physical Conditioning	3 s.h.

M.A. with Thesis

The study program leading to the M.A. with thesis is designed primarily as a first step in a program of graduate study leading to the Ph.D. degree. There is particular emphasis upon techniques of research as applied to problems related to physical education and athletics. A secondary purpose of this program is to provide advanced preparation for those who are teaching, or intend to teach, in programs for undergraduate majors in physical education in four-year colleges, but who do not plan to continue on to the doctorate. An attempt is made to thoroughly acquaint candidates with the nature and extent of research in all areas of physical education and to provide some degree of specialization in an area of particular interest to the student.

Undergraduate Prerequisites

The undergraduate coursework listed below is required. Any or all of it may be taken after the student has been admitted to graduate study in physical education, but it should be taken at the earliest opportunity.

Adapted physical education	2 s.h.
Human physiology	3 s.h.
Human anatomy	2 s.h.
Methods in physical education or administration	3 s.h
or	
Administration of physical education and athletics	3 s.h.
Intermediate algebra	3 s.h.
Teaching of recreational sports	4 s.h.
Practice teaching	2 s.h.
Electives in physical education and related areas	11 s.h.
Total	30 s.h.

In addition to these courses, undergraduate courses in chemistry, physics, zoology, mathematics, and the physiology of exercise are highly desirable and may be included as electives in related areas.

Graduate requirements

The courses listed below are required for the M.A. degree with thesis.

Nature and Extent of Field

27:240 Professional Preparation in Physical Education	2 s.h.

Three courses selected from the following:

72:202 Exercise Physiology	2 s.h.
27:257 Biomechanics of Human Motion	4 s.h.
27:267 Advanced Measurement and Evaluation in Physical Education	3 s.h.
27:308 Human Perceptual-Motor Performance	4 s.h.
27:337 Seminar: Research in Physical Education Curriculum	3 s.h.

Tools of Research

7P:143 Introduction to Statistical Methods	3 s.h.
or	
63:161 Introduction to Biostatistics	3 s.h.
22C:100 Introduction to Computing with Fortran	3 s.h.
or	
7P:248 Data Processing	3 s.h.

Specialization Area

27:401 Seminar in Scientific Writing	1 s.h.
27:404 Thesis: M.A.	4 s.h.
Courses in specialization area approved by adviser	5-7 s.h.
Total	30 s.h.

Ph.D. Program

The Ph.D. program in physical education is based on the concept that the successful candidate should have a broad knowledge of all areas of physical education, a working

knowledge of the research techniques which may appropriately be applied to problems in physical education and athletics, and knowledge in depth in at least one of the accepted areas of specialization in physical education.

The areas of specialization offered in physical education are adapted physical education, administration and supervision in physical education, anatomy, biomechanics, curriculum in physical education, exercise physiology, measurement and evaluation in physical education, motor behavior, and therapeutics.

A broad background in all areas of physical education, together with a working knowledge of appropriate research techniques, is provided through the required courses in the M.A. with thesis curriculum and the core of courses required for all Ph.D. candidates. With the exception of six semester hours of statistics, all of these courses are taught by members of the physical education faculty.

The candidate is required to complete a minimum of 30 semester hours of graduate work in the specialization of his or her choice and to write a thesis on a problem in that area. The thesis must be submitted to a reputable journal for publication before the Ph.D. is granted. Most of the courses in the areas of specialization are offered by departments other than the Department of Physical Education—Field House. Professors from these departments participate in writing and evaluating the comprehensive examinations, serve on thesis committees for the initial presentation of the proposed problem, and participate in the final examination in which the candidate defends his or her thesis. In addition to writing a comprehensive examination in physical education, the candidate specializing in exercise physiology writes a comprehensive examination prepared and evaluated by faculty members of the Department of Physiology and Biophysics in the College of Medicine. Such candidates graduate with minors in physiology.

Graduates of the Ph.D. program in physical education have obtained excellent positions in highly reputable colleges and universities throughout the United States and in a number of foreign countries.

Prerequisites

Completion of the requirements for the M.A. degree with thesis is required. Any or all of these requirements may be completed after the student has been admitted to graduate work in physical education, but they should be completed at the earliest opportunity. If the student has the M.A. degree without thesis, the equivalent of the M.A. thesis must be completed before taking the comprehensive examination for the Ph.D. degree.

Requirements

The student must complete the core requirements and the requirements for at least one area of specialization.

The core requirements include:

27:405 Thesis: Ph.D.	12 s.h.
7P:242 Selected Applications of Statistical Techniques	3 s.h.
or	
63:162 Design and Analysis of Experiments in Biomedical Sciences	3 s.h.
and	
27:202 Practicum in College Teaching	arr.

The foreign language requirement differs for each area of specialization. All candidates not required to demonstrate proficiency in a foreign language must satisfactorily complete 7P:248 Data Processing or 22C:100 Introduction to Computing with FORTRAN.

A minimum of 30 semester hours of required and elective courses must be completed in the candidate's area of specialization. The courses required by area of specialization are:

Adapted Physical Education

7U:130 Exceptional Children	3 s.h.
27:201 Research	3-6 s.h.
27:205 Adapted Physical Education: Special Topics and Research	4 s.h.
60:108 Human Anatomy	4 s.h.
60:109 Human Anatomy and Neuroanatomy	4 s.h.

Administration and Supervision in Physical Education

27:242 Supervision of Physical Education	3 s.h.
7D:201 Foundations of School Administration	3 s.h.
27:201 Research	4 s.h.
27:207 Advanced Administration of Physical Education	2 s.h.
27:227 Advanced Administration of Athletics	2 s.h.
27:240 Professional Preparation in Physical Education	2 s.h.

Anatomy

60:203 Gross Human Anatomy for Graduate Students	8 s.h.
or	
60:109 Human Anatomy and Neuroanatomy	4 s.h.
and	
60:110 Neurobiology and Behavior	4 s.h.
37:112 Cell, Tissue, and Organ Biology	5 s.h.
27:153 Advanced Anatomy and Kinesiology	5 s.h.
27:295 Electromyography in Kinesiology and Biomechanics	3 s.h.

Biomechanics

527:190 Readings in Energy Engineering (include mechanics of fluids, transfer processes and deformable bodies)	6 s.h.
60:109 Human Anatomy and Neuroanatomy	4 s.h.
27:202 Practicum in College Teaching	2-4 s.h.
27:295 Electromyography in Kinesiology and Biomechanics	3 s.h.
27:357 Research Techniques in Biomechanics	4 s.h.

Curriculum in Physical Education

Elementary Curriculum	3 s.h.
7S:291 Secondary School Curriculum	3 s.h.
7P:332 Seminar: Educational Psychology II: Psychology of Learning	2-3 s.h.
27:201 Research	arr.
27:202 Practicum in College Teaching	arr.
27:240 Professional Preparation in Physical Education	2 s.h.
27:338 Seminar: Models and Theory in Curriculum	2 s.h.
28:243 Philosophical Bases of Curriculum Construction	3 s.h.

Exercise Physiology

72:274 Advanced Exercise Physiology Seminar	2 s.h.
72:212 Medical Physiology	6 s.h.
72:312 Special Topics	2-4 s.h.
99:130 Metabolism	3 s.h.

Measurement and Evaluation

22C:100 Introduction to Computing with FORTRAN	3 s.h.
7P:243 Intermediate Statistical Methods	4 s.h.
and	

7P:244 Correlation Methods 3 s.h.
or
22S:153 Introduction to Probability 3 s.h.
and
22S:154 Introduction to Mathematical Statistics I 3 s.h.

7P:246 Design of Experiments 4 s.h.
7P:255 Construction and Use of Classroom Evaluation Instruments 3 s.h.
7P:257 Educational Measurement and Evaluation 3 s.h.
27:367 Seminar: Research in Measurement and Evaluation in Physical Education arr.

Motor Behavior and Learning

27:312 Selected Issues in Information Processing and in Motor Control 3 s.h.
27:314 Seminar in Motor Behavior Research 3 s.h.
31:223 Information Processing in Psychology 3 s.h.

Therapeutics

101:327 Research in Therapeutics 5 s.h.
101:214 Principles of Human Motion II 3 s.h.

72:110 Neurobiology and Behavior 5 s.h.
or
72:271 Advanced Cardiovascular Pharmacology and Physiology 2 s.h.

60:105 Microscopic Anatomy for Medical Students 4 s.h.
or
527:190 Readings in Energy Engineering 2 s.h.
or
72:274 Advanced Exercise Physiology Seminar 2 s.h.

72:281 Advanced Neurophysiology: Muscle 2 s.h.

Admission Requirements

M.A. with and without Thesis

For admission to the program leading to the M.A. degree with or without thesis, see the admissions requirements prescribed by the Graduate College.

Ph.D. Program

The student is admitted to the study program leading to the Ph.D. degree on the basis of his or her grade-point average on the work completed for the M.A. or M.S. degree, and his or her score on the Graduate Record Examination (Aptitude Test). To be considered for admission, the student must have earned a grade-point average of 3.0 or higher on all graduate work undertaken.

Facilities

The Recreation Building and Field House provide excellent facilities for use in the physical education skills program, in the undergraduate and graduate instructional programs, and for student participation in intramural sports, recreational activities and athletics.

Research laboratories for physiology of exercise, stress, motor behavior and biomechanics are located in the Field House and provide excellent facilities for instruction and research at both the undergraduate and graduate levels.

Because of our cooperative efforts with other departments to facilitate specialization, physical education students use additional special facilities in other departments on the campus.

Courses

Primarily for Undergraduates

27:1 Elective Physical Education 1 s.h.
Elective for students who have satisfied requirements for physical education skills (see "Basic Skills").

27:2 Elective Physical Education 0 s.h.

27:9 Elective Physical Education 0 s.h.
Open to any student who does not wish academic credit or who desires to attend a class for only one-half the semester.

27:11 Introduction to Physical Education 0 s.h.
Orientation lectures on historical and educational aspects of physical education. First semester.

27:20 Social Forms of Dance 1-2 s.h.
First semester. Same as 28D:20.

27:21 Teaching of Recreational Sports I 2 s.h.
Techniques and methods of teaching; organizing groups for participation. First semester.

27:22 Teaching of Recreational Sports II 2 s.h.
Second semester. Continuation of 27:21.

27:31 Teaching of Gymnastics 2 s.h.
Teaching techniques of conditioning exercises, elementary apparatus and tumbling exercises.

27:32 Coaching of Gymnastics 2 s.h.
Prerequisite: high school varsity experience or equivalent.

27:33 Coaching of Football 2 s.h.
Second semester. Prerequisite: high school varsity experience or equivalent.

27:34 Coaching of Baseball 2 s.h.
Second semester. Prerequisite: high school varsity experience or equivalent.

27:35 Coaching of Track and Field Athletics 2 s.h.
First semester. Prerequisite: high school varsity experience or equivalent.

27:36 Coaching of Basketball 2 s.h.
First semester. Prerequisite: high school varsity experience or equivalent.

27:37 Teaching of Swimming 2 s.h.

27:38 Coaching of Competitive Swimming 2 s.h.
Second semester. Prerequisite: high school varsity experience or equivalent.

27:39 Coaching of Wrestling 2 s.h.
First Semester. Prerequisite: high school varsity experience or equivalent.

27:42 Officiating of Football, Basketball, and Baseball 2 s.h.
First semester.

27:43 Administration of Intramural Athletics 2 s.h.
Second semester.

27:53 Human Anatomy 2 s.h.

27:56 First Aid 0 s.h.

27:57 Introduction to Athletic Training 2 s.h.
Prerequisite: 27:53.

27:58 Practicum in Special Physical Education 3 s.h.
Laboratory experience in adapted physical education, exercise therapy and corrective therapy. First semester. Prerequisites: 72:13 and 27:53.

27:59 Practicum in Special Physical Education 3 s.h.
Continuation of 27:58. Second semester.

27:96 Special Projects arr.

27:97 Leadership Training I 1 s.h.
Consult instructor before registering.

27:98 Leadership Training II 1 s.h.
Consult instructor before registering.

27:99 Leadership Training III 1 s.h.
Consult instructor before registering.

For Undergraduates and Graduates

27:102 Issues and Trends in Physical Education and Athletics 2 s.h.
First semester.

27:103 Administration of Physical Education and Athletics 2-3 s.h.
Second semester.

27:105 Adapted Physical Education 2 s.h.
Second semester. Prerequisite: 27:53.

27:106 Scientific Aspects of Sports Skills 3 s.h.
Saturday and Evening Class Summer Program.

27:107 Biomechanics of Physical Education 3 s.h.
Introduction to biomechanical concepts and their application to physical education activities.

27:108 Introduction to Human Perceptual-Motor Performance 3 s.h.
Second semester.

27:109 Workshop in Growth and Development 1 s.h.
Summer session.

27:111 History of Physical Education 3 s.h.
Correspondence course.

27:112 Workshop: Exercise and Aging 1 s.h.
The course includes the effects of exercise on the aging process and of aging on the ability to exercise, selected fitness concerns relative to older adults and the elderly, and the development of fitness programs for the elderly.

27:120 Track and Field Athletics 2 s.h.
Correspondence course.

27:130 Workshop in Advanced Athletic Coaching 1 s.h.
Summer session.

27:131 Advanced Theory and Techniques of Swimming and Diving 2 s.h.
First semester.

27:137 School Physical Education Programs 2 s.h.
First semester. Same as 7E:137, 7S:137.

27:140 Workshop: Physiological Effects of Activity 1 s.h.
Summer session.

27:141 Elementary Exercise Physiology 2 s.h.
First semester. Prerequisite: 72:13.

27:147 Knowledge and Performance Tests in Physical Education 2 s.h.
First semester.

27:153 Advanced Anatomy and Kinesiology 2-3, 5 s.h.
Emphasis on preparation for teaching anatomy and kinesiology at the undergraduate level. Second semester.

27:155 Advanced Instruction in Selected Activities arr.
Division of Continuing Education.

27:156 Sports and Movement for Drama 1 s.h.
May be repeated.

27:157 Biomechanics of Athletics 3 s.h.
Second semester. Prerequisite: 27:107.

27:159 Physical Education for Elementary Schools 2-3 s.h.
First semester. Same as 7E:140.

27:160 Perceptual Motor Skill Development in Children 3 s.h.
First semester. Same as 28:140.

27:167 Measurement and Evaluation in Physical Education 3 s.h.
Second semester. Prerequisite: 27:147.

27:170 Workshop in Athletic Training 1 s.h.
Summer session.

27:171 Medical Supervision of Athletics 2-3 s.h.
Second semester.

27:182 Evaluative Techniques in Athletic Training 2 s.h.
First semester. Prerequisite: 27:57.

27:183 Athletic Training: Modalities and Therapeutics 2 s.h.
Second semester. Prerequisite: 27:182.

27:184 Laboratory Practice in Athletic Training 2 s.h.

Primarily for Graduates

27:201 Research arr.
Consult Department head before registering.

27:202 Practicum in College Teaching arr.

27:203 Psychology of Sport 3 s.h.
Psychological principles and their application to sport.

27:205 Adapted Physical Education: Special Topics and Research 4 s.h.
First semester. Prerequisites: 27:53 and 27:105.

27:207 Advanced Administration of Physical Education 2 s.h.
First semester.

27:208 Seminar: Contemporary Issues in Motor Behavior 0 s.h.
Informal seminar in which current developments in motor behavior are discussed.

27:227 Advanced Administration of Athletics 2 s.h.
First semester.

27:237 Public School Curriculum in Physical Education 3 s.h.
Second semester. Same as 7E:237, 7S:345.

27:240 Professional Preparation in Physical Education 2 s.h.
Critical analysis of current undergraduate and graduate programs in physical education. Second semester.

27:241 Scientific Principles of Physical Conditioning 1, 3 s.h.
Summer. Prerequisite: 72:13 or 27:141.

27:242 Supervision of Physical Education 3 s.h.
First semester. Same as 7E:242, 7S:242.

27:257 Biomechanics of Human Motion 4 s.h.
Second semester. Prerequisite: 27:157.

27:258 Seminar: Current Developments in Biomechanics 0 s.h.

27:267 Advanced Measurement and Evaluation in Physical Education 3 s.h.
Second semester.

27:295 Electromyography in Kinesiology and Biomechanics 3 s.h.
Introduction to electromyographic techniques for the study of muscle activity in human motion. Second semester. Same as 101:295.

27:301 Non-Thesis Seminar 3 s.h.
Required for candidates for M.A. without thesis. Second semester.

27:305 Seminar: Physical Education for the Mentally Retarded 2 s.h.
First semester.

27:308 Human Perceptual-Motor Performance 3-4 s.h.
Motor learning principles and practical implications for teaching. First semester.

27:310 Colloquium 0 s.h.
Special lecturers.

27:311 Orientation to Graduate Study 0 s.h.
First semester.

27:312 Selected Issues in Information Processing and in Motor Control 3 s.h.
Evaluation of research literature in motor learning and motor performance. Second semester. Prerequisite: 27:308.

27:314 Seminar in Motor Behavior Research 3 s.h.
Second semester.

27:337 Seminar: Research in Physical Education Curriculum 3 s.h.
Students who have not completed 27:237 or equivalent must elect 27:237. First semester.

27:338 Seminar: Models and Theory in Curriculum 2 s.h.
First semester.

27:357 Research Techniques in Biomechanics 4 s.h.
Second semester.

27:387 Seminar: Research in Measurement and Evaluation in Physical Education arr.

27:401 Seminar in Scientific Writing 1 s.h.
Second semester.

27:402 Research Methods in Physical Education 2 s.h.

27:404 Thesis: M.A. 0-4 s.h.

27:405 Thesis: Ph.D arr.
Not to exceed 12 semester hours.

Physical Education and Dance—Halsey Gymnasium

Chair: Margaret G. Fox
Faculty: *professor* Margaret G. Fox
professor emerita M. Gladys Scott
associate professor Jeannette L. Scahill
assistant professors Judith N. Allen, Norma P. Burke, Jane E. Clark, Christine H-B. Grant, Judith K. McCune, Yvonne L. Slatton, Carol L. Stamm
instructors Catherine Ballard, Lark L. Birdsong, Alicia A. Brown, Katherine M. Carlson, Jerry Ann Donaldson, Marjorie N. Greenberg, Georgianne Greene, Jane A. Hagedorn, Terttu Haronoja, Jerald M. Hassard, Linda Simmons, Diane M. Thomason, Deborah L. Woodside
Degrees offered: B.A., B.S., M.A., Ph.D.

The Department of Physical Education and Dance (Halsey Gymnasium) offers instruction in physical education (teaching and nonteaching majors), the coaching of sports, the teaching of dance and dance performance, pre-physical therapy, and sports communications.

Graduate work is offered leading to an M.A. in physical education, dance, and sports communications, and to a Ph.D. in physical education.

Physical Education Major

Undergraduate Curricula

Each student in the physical education curriculum elects a wide variety of courses and activities, thus preparing for careers in business/industry, sports journalism/broadcasting, fitness/health clubs, professional dance/theater, and public school teaching and coaching.

Theoretical background is provided through anatomical, kinesiological, physiological, and health courses, with implications for the performance and teaching of movement skills.

The undergraduate physical education curriculum is also designed to provide the background for a student to enter a graduate program in physical education. (See "Graduate Programs" for areas of specialization.)

The student who plans to teach must meet certification requirements (see "College of

Education"). The teaching curriculum leads to either the B.A. or B.S. degree. A student failing to maintain a grade-point average of 2.2, or displaying marked inadequacies for teaching or a leadership role, may be dropped from the program.

The pre-physical therapy curriculum leading to a B.S. degree is modeled on the basic science program with electives in physical education. It is designed to prepare students for admission to graduate programs in physical therapy, but not for teaching.

The Department also administers a nonprofessional major in health and physical education known as General Studies in Health, Physical Education and Recreation. The purpose of this program is to give a background in health, physical education, and recreation, not in preparation for a career but to give a broad acquaintanceship with material relevant to personal and family recreation and healthful living. Each student's program is individually planned with an adviser, following broad guidelines and oriented to the student's objectives.

Physical Education Teaching Curriculum

28:18 Senior Life Saving and Water Safety Instructor's Course	1-2 s.h.
28:19-20 Introduction to Human Movement	3 s.h.
28:25-26 Teaching of Sports	4 s.h.
28:27 Teaching of Dance	2 s.h.
28:31-32 Officiating	2 s.h.
28:37 Advanced First Aid	3 s.h.
or	
Red Cross Certification	
28:40 Tennis	1 s.h.
28:41 Golf	1 s.h.
28:42 Badminton	1 s.h.
28:43 Volleyball	1 s.h.
28:47 Gymnastics	2 s.h.
28:48 Ballroom Dance	1 s.h.
28:49 Field Sports	1 s.h.
28:50 Softball	1 s.h.
28:51 Field Hockey	1 s.h.
28:52 Basketball	1 s.h.
28:53 Modern Dance I	1 s.h.
or	
Jazz	
28:56 Track and Field	1 s.h.
28:57 Recreational Sports	1 s.h.
28:80 Anatomy	4 s.h.
28:81 Kinesiology	3 s.h.
28:93 Honors Readings	arr.
28:94 Honors Readings	arr.
28:106 Physiological Implications for Teaching Physical Education	3 s.h.
28:107 Physical Education for the Atypical	3 s.h.
28:113 Measurement	2 s.h.
28:120 Organization and Administration of Physical Education	2 s.h.
28:121 History and Philosophy of Physical Education	1-2 s.h.
28:142 Contemporary Issues of Health Education	3 s.h.
7E:71-72 Methods and Materials in Elementary School Physical Education	4 s.h.
7S:146 Methods and Principles of Physical Education	3 s.h.
7S:190 Individual Projects in Laboratory Practice (Coaching Practicum)	2-3 s.h.
7S:191 Observation and Laboratory Practice in Secondary School	6 s.h.
7E:192 Laboratory Practice in Elementary School	6 s.h.
7S:187 Seminar Curriculum and Student Teaching	1 s.h.

For certification requirements in education, see "College of Education." For general requirements of the College of Liberal Arts, see "College of Liberal Arts."

Program Leading to Endorsement for Coaching

28:14 Coaching Women's Sports	2 s.h.
or	
28:218 Advanced Coaching	2 s.h.
28:81 Kinesiology	3 s.h.
28:105 Care of Athletic Injuries	2 s.h.
28:106 Physiological Implications for Teaching Physical Education	3 s.h.
7E:71 Methods and Materials in Elementary School Physical Education	2 s.h.
or	
7P:106 Child Development	3 s.h.
7S:190 Individual Projects in Laboratory Practice (Coaching Practicum)	2-3 s.h.

General Studies in Health, Physical Education, and Recreation

The purpose of this program is to give a background in health, physical education and recreation, not as a preparation for a career in this field but as a broad acquaintance with material relevant to personal and family recreation and healthful living. Each student's program is planned with an adviser on the basis of the student's objectives.

Basic courses for all in the nonprofessional major are 28:1, 28:7, 28:40-43, 28:47-57 or equivalent experience (combination of these for a total of seven to eight semester hours); 28:37 for a total of three hours and 104:61, 104:65 for a total of three to six semester hours.

Supplementary courses of 20 to 24 semester hours may be elected to complete a major of 36 semester hours. These elective hours should be from the following fields: art, dramatic art, environmental health, home economics, music, physical education, psychology, recreation or sociology. At least 18 of the 36 semester hours must be 100-level courses.

Health Education Secondary Approval

This secondary approval area (minimum standards, not a major) for Iowa Endorsement 20 teacher certification requires a minimum of 26 semester hours of credit, including the following required courses:

17:10 Growth and Development of the Young Child	3 s.h.
17:41 Food, Nutrition, and Man	3 s.h.
27:53 Human Anatomy	2 s.h.
or	
28:80 Anatomy	4 s.h.
46:56 Non-Prescription Drugs	2 s.h.
27:56 First Aid	0 s.h.
or	
28:37 Advanced First Aid	3 s.h.
or	
Red Cross certification	
72:13 Introduction to Human Physiology	4 s.h.
7C:112 Human Sexuality	3 s.h.
28:142 Contemporary Issues of Health Education	3 s.h.
28:144 Administration of School Health Program	3 s.h.
28:146 Health Instruction for Secondary Schools	3 s.h.

Approval to Teach Health in Grades K-9

To qualify for approval to teach health in grades K-9 within the elementary education program (Iowa Endorsement 10), the

student must earn at least 26 semester hours in that area of specialization, including these required courses:

17:41 Food, Nutrition, and Man	3 s.h.
27:53 Human Anatomy	2 s.h.
or	
28:80 Anatomy	4 s.h.
27:56 First Aid	0 s.h.
or	
28:37 Advanced First Aid	3 s.h.
or	
Red Cross certification	
46:56 Non-Prescription Drugs	2 s.h.
72:13 Introduction to Human Physiology	4 s.h.
7P:106 Child Development	3 s.h.
7C:112 Human Sexuality	3 s.h.
28:142 Contemporary Issues of Health Education	3 s.h.
28:144 Administration of School Health Program	3 s.h.
28:145 Methods: Health Instruction for Elementary Grades	3 s.h.

Honors Program

The Honors Program is designed to serve the interests of the superior student. To be eligible for Honors, the student must have at least a "B" average at the beginning of the junior or senior year when Honors courses are taken, and must continue to maintain a "B" average throughout the remainder of his or her college work. This is an opportunity to get some experience in research and gain a perspective on certain aspects of graduate work.

Graduate Programs

The Department was one of the pioneers in graduate physical education programs for women. In the more than half century of graduate work there has been a growing philosophy of education for women and many of the graduates of these programs have played and are still playing leadership roles in the profession, in their institutions and their communities.

The curricula assume previous education in the respective fields. A program is planned with the individual in light of his or her previous education and anticipated future career. Completion of the graduate degree usually leads to teaching, administration or supervision in the schools or in a university. Research preparation is provided for anyone who wishes a career in that area. All M.A. students do some type of research, though the options are highly variable.

The outstanding characteristics of the graduate programs are flexibility of program planning for the individual student and diversity of areas of research which are available to the student. Attendance at both summer sessions and the academic year is helpful in obtaining full opportunities for diversity of instruction.

The graduate student works primarily in the Department of Physical Education and Dance, but the resources of the entire University are available, as needed, for the individual student. Work outside the Department provides a broader view and enrichment for the selected specialization of the master's and doctoral candidate. The most common areas of specialization have been administration of athletics and physical education, coaching, measurement and evaluation, motor development, history and development of physical education and sport, sociology of sport, and sports communication. Internships are available in many areas, and are strongly encouraged for specializations in administration and communication. The graduate student group is cosmopolitan and international in makeup.

A research laboratory is available in Halsey Gymnasium. It is equipped primarily for kinesiological and biomechanics research and motor learning, including equipment for electromyographic research. Other needs may be met on a cooperative basis. Complete computer service is available as needed for research.

The Master of Arts Degree

The M.A. degree is awarded on completion of at least 30 semester hours of graduate work including thesis, or 32 hours including a project. The curriculum may lead to teaching, administration, supervision in the schools, coaching certification, or preparation for advanced degree work in the chosen area of specialization.

Background is required in anatomy, kinesiology, physiology, health education, methods in physical education, administration of physical education and physical education techniques.

General Field Recommendations

*28:107 Physical Education for the Atypical	3 s.h.
*28:113 Measurement	2 s.h.
*28:119 Methods and Principles of Physical Education	3 s.h.
*28:121 History and Philosophy of Physical Education	2 s.h.
28:205 Techniques of Research	3-4 s.h.
*28:215 Analysis of Human Motion	3 s.h.
28:201 Problems in Physical Education	2 s.h.
or	
28:401 Thesis	4 s.h.
28:302 Seminar: Perspectives in Human Movement	2 s.h.

*Not required of those having similar undergraduate courses. No more than 5 s.h. of these courses may be counted toward the M.A. degree.

Electives

The remainder of the program is planned with the approval of the adviser and the chair of the Department. A student may be permitted to take a nonthesis M.A. Such a curriculum requires a minimum of 30 semester hours plus a project instead of a thesis and specified courses.

Students may elect either a general master's program or a specialized curriculum. Specialized programs are offered in administration, coaching, dance, measurement and evaluation, motor development, philosophy of physical education and sport, sociology of physical education and sport, sports communications. Students desiring other specializations are encouraged to submit a course of study to the graduate committee for consideration.

The Doctor of Philosophy Degree

The Ph.D. degree is awarded on completion of approximately 90 semester hours of graduate work, including general requirements for the master's degree and credit for the dissertation.

Prerequisites

Background is required in anatomy, kinesiology, physiology, health education, methods in physical education, administration of physical education and physical education techniques.

Tools of Research

As a basis for research and/or broad reading of international professional literature, students in this program must have an appropriate level of proficiency in statistical methods, and either a minimum of first-year reading ability in a foreign language or, if it is an appropriate alternative, basic computer

skills. The student may satisfy the language requirement with certification from the language department or by the Graduate Record Examination in the language.

General Field Recommendations

28:106 Physiological Implications for Teaching Physical Education (or equivalent)	3 s.h.
*28:107 Physical Education for the Atypical	3 s.h.
*28:113 Measurement	2 s.h.
*28:119 Methods and Principles of Physical Education	3 s.h.
*28:121 History and Philosophy of Physical Education	2 s.h.
28:201 Problems in Physical Education (unless student wrote an M.A. thesis)	0-4 s.h.
28:205 Techniques of Research	3-4 s.h.
28:215 Analysis of Human Motion	3 s.h.
28:319 Administration in Physical Education	3 s.h.
28:301 Seminar in Research	2 s.h.
28:302 Seminar: Perspectives in Human Movement	2 s.h.
28:401 Thesis	10 s.h.

*Not required of those having undergraduate or graduate courses. No more than 5 s.h. of these courses may be counted toward the Ph.D., and usually they will be taken for zero credit.

Specialization

At least 30 semester hours are required in one area or in two related areas at the discretion of the adviser. Suggested areas:

Administration of Physical Education or Athletics
Correctives (Adaptives)
Measurement
Motor Development
Philosophy and History of Physical Education or Sport
Sociology of Sport
Statistics and Research

Students may petition for other areas not listed.

In addition to the dissertation requirement, all doctoral candidates must write comprehensive examinations in their area of specialization.

Dance Major

The Undergraduate Program

Required

28D:112 Rhythmic Analysis of Dance	2 s.h.
28D:127 Dance Production	2 s.h.
28:80 Anatomy	4 s.h.
28:81 Kinesiology	3 s.h.
28D:114 History and Appreciation of Dance	3 s.h.
28D:115 Twentieth Century Dance	3 s.h.
28D:123-124 Composition I-II	4 s.h.
28D:171-172 Dance Company Class	2 s.h.
28D:177 Beginning Labanotation	3 s.h.
36T:100 Dramatic Art Laboratory	arr.

Electives

12 hours from the following or related subjects in theater, music, art:

*28D:23 Teaching of Modern Dance	2-4 s.h.
28D:91 Independent Study	arr.
*28D:111 Methods and Materials of Teaching Children's Dance	3 s.h.
28D:113 Ballet Pointe	2 s.h.
28D:116 Dance in Education	2-3 s.h.
28D:117 Ballet Pedagogy	2 s.h.
28D:122 Workshop: Artist in Residence	1-4 s.h.
28D:128 Dance Production Laboratory	1-6 s.h.
28D:130 Improvisation	1 s.h.
28D:141 Introduction to Movement: Dynamics and Personality Growth	3 s.h.
28D:142 Introduction to Movement: Dynamics and Personality Growth	3 s.h.
28D:170 Readings in Dance	arr.
28D:173-174 Composition III-IV	arr.
28D:175 Dance Theory	3-6 s.h.
28D:176 Criticism of Dance	3-6 s.h.
28D:178 Intermediate Labanotation	3 s.h.
28D:181 Dance Company Class	1-2 s.h.

*Required of all dance majors in the teaching curriculum. 28:37 Advanced First Aid or Red Cross certification also required of all majors in teaching curriculum. See "College of Education" for certification requirements for public school teaching.

Dance majors must take a technique class each semester with a maximum of 14 hours allowed toward a degree, and including a minimum of 4 s.h. of ballet and 4 s.h. of modern.

The M.A. Program

The M.A. degree in dance is awarded on completion of at least 30 semester hours of graduate work including thesis. The curriculum may lead to teaching of dance or to further work toward a dance career.

Prerequisites

Audition
Intermediate modern or ballet technique

28D:112 Rhythmic Analysis of Dance	2 s.h.
28D:114 History and Appreciation of Dance	3 s.h.
28D:123-124 Composition I-II	4 s.h.
28D:127 Dance Production	2 s.h.
28:80 Anatomy	4 s.h.
28:81 Kinesiology or equivalent	3 s.h.

Required

28D:115 Twentieth-Century Dance or 28D:173-174 Composition III-IV	3 s.h. 2 s.h.
28D:125 Dance Techniques	2 s.h.
28D:175 Dance Theory or 28D:176 Criticism of Dance	3 s.h. 3 s.h.
28D:177 Beginning Labanotation	3 s.h.
28D:204 Seminar: Dance or 28:302 Seminar: Perspectives in Human Movement	2 s.h. 2 s.h.
28D:205 Techniques of Research	3-4 s.h.
28D:401 Thesis	3-4 s.h.
28:216 Physiological Functioning in Physical Education	3 s.h.
36T:100 Dramatic Art Laboratory	1 s.h.

Elective courses may be taken in related fields of physical education, music, theater, and/or art, with consent of adviser.

Faculty

The faculty represents diversified backgrounds and specializations. Abilities and interest are complementary. Most faculty members hold advanced degrees. Several bring educational backgrounds from abroad. All are experienced teachers. Graduate faculty members are experienced in research and writing and are available for

the guidance of graduate students in their areas of specialization.

Facilities

Gymnasiums, dance studios, special exercise rooms and pools are used in the various programs in Halsey Gymnasium, North Hall, the Field House, the Recreation Building and the recreation area at the Memorial Union. The field for outdoor sports and hard surfaced tennis courts are near Halsey Gymnasium. The proximity of the river makes canoeing instruction feasible on a regular class schedule. The archery range is located along the river in a rustic setting; outdoor fields and a track are available between the Field House and the Recreational Building. The University golf course is used for some classes and for the women's intercollegiate golf team.

Courses

Physical Education

Primarily for Undergraduates

28:1 Elective Physical Education 1 s.h.
Physical education majors only. May be repeated.

28:7 Advanced Physical Education 1 s.h.
Elective; open to those who have completed requirement in physical education skills. May be repeated.

28:14 Coaching Women's Sports 2 s.h.
Introduction to the techniques and psychology of coaching.

28:18 Senior Life Saving and Water Safety Instructor's Course 1-2 s.h.
Leads to Red Cross Senior Water Safety Certificate or Instructor's Certificate. Register after consultation with instructor.

28:19 Introduction to Human Movement 2 s.h.
Study of the profession of physical education and related disciplines; seminar approach with guest speakers; job alternatives and opportunities discussed.

28:20 Introduction to Human Movement 1 s.h.
Prerequisite: 28:19 or consent of instructor.

28:25 Teaching of Sports 2 s.h.
Teaching of team sports.

28:26 Teaching of Sports 2 s.h.
Continuation of 28:25; teaching of individual sports, including swimming.

28:27 Teaching of Dance 2 s.h.
Methods course for the teaching of ballroom, folk and square dance; included are observations of classes in progress, lesson planning, evaluative procedures, materials, teaching aids and the teaching of elementary, secondary and college classes.

28:30 Recreational Physical Education 0 s.h.
Varied activities open to all students.

28:31 Officiating 1 s.h.
Officiating techniques for team sports.

28:32 Officiating 1-2 s.h.
May follow 28:31 or be taken as independent unit.

28:37 Advanced First Aid 3 s.h.
Leads to certification for American Red Cross Advanced First Aid and Emergency Care Certificate.

28:40 Tennis 1 s.h.

28:41 Golf 1 s.h.

28:42 Badminton 1 s.h.

28:43 Volleyball 1 s.h.

28:47 Gymnastics 2 s.h.

28:48 Ballroom Dance 1 s.h.

28:49 Field Sports 1 s.h.

28:50 Softball 1 s.h.

28:51 Field Hockey 1 s.h.

28:52 Basketball 1 s.h.

28:53 Modern Dance I 1 s.h.

28:54 Modern Dance II 1 s.h.

28:55 Folk and Square Dance 1 s.h.
Basic skills dance course; beginning to intermediate-level western square dance, beginning to intermediate international folk dance; background and cultural information included.

28:56 Track and Field 1 s.h.

28:57 Recreational Sports 1 s.h.

28:71 Methods and Materials in Elementary School Physical Education 2 s.h.
Theoretical bases for elementary physical education, including growth and motor development. Fall. Same as 7E:71.

28:72 Methods and Materials in Elementary School Physical Education 2 s.h.
Practical considerations and curriculum planning for prospective teachers of elementary school physical education. Spring. Prerequisite: 28:71 or 7E:71. Same as 7E:72.

28:80 Anatomy 4 s.h.
Required of all students majoring in physical education; general human anatomy, with emphasis on factors influencing movement. Fall.

28:81 Kinesiology 3 s.h.
Mechanics of human movement and analysis of motor skills. Spring. Prerequisite: 28:80.

28:91 Independent Study arr.

28:93 Honors Readings arr.

28:94 Honors Readings arr.

For Undergraduates and Graduates

28:101 Fitness for the Individual 3 s.h.
Fitness needs of youth and adults, physiological process of conditioning.

28:102 Research on Women in Sports 2-3 s.h.
Review of research completed, and planning for research needed relative to women in competitive programs.

28:104 Health Education Workshop 1-2 s.h.

28:105 Care of Athletic Injuries 2 s.h.
Immediate care and rehabilitative treatment of injuries occurring in women's sports. Spring.

28:106 Physiological Implications for Teaching Physical Education 2-3 s.h.
Physiological effects of exercise and lack of exercise, methods of conditioning for various exercise programs. Fall.

28:107 Physical Education for the Atypical 2-3 s.h.
Mechanics of posture and common abnormalities of spine and feet; adaptation of program for the atypical student. Spring. Prerequisites: 28:80 and 28:81 or equivalent.

28:108 Principles and Administration of Intercollegiates for Women 2 s.h.
Conduct of intercollegiates designed to provide educational value for the participant.

28:109 Coaching 1-4 s.h.
Selected sports for skilled players; analysis and coaching techniques presented in workshop by experienced coaches.

28:110 Workshop: Methods of Teaching Sports 1-4 s.h.
Selected sports and the teaching of each for beginners as well as for the more skilled; adaptation to different age levels; presented in workshop form by experienced teachers.

28:113 Measurement 2 s.h.
Practical and theoretical considerations in the selection, construction and administration of motor performance tests. Experiences include the analysis of sets and test scores.

28:119 Methods and Principles of Physical Education 3 s.h.
Philosophical bases of teaching and learning. Fall. Same as 7S:146.

28:120 Organization and Administration of Physical Education 2 s.h.
Fall.

28:121 History and Philosophy of Physical Education 1-2 s.h.
Spring.

28:130 Sports Participation for Girls and Women 2 s.h.

28:137 Advanced First Aid and Instructor Training 3 s.h.

28:140 Perceptual and Motor Skill Development in Children 3 s.h.
Basic mechanisms underlying development of perceptual motor skills in young children. Same as 27:160.

28:142 Contemporary Issues of Health Education 3 s.h.
Physical education and recreation programs in schools as related to health of youth in today's society.

28:143 Health Problems of Youth 1 s.h.
Workshop on current health problems.

28:144 Administration of School Health Program 3 s.h.
Current administrative factors affecting curriculum construction and program trends in health education K-12. Required for health education certification K-9 and 7-12.

28:145 Methods: Health Instruction for Elementary Grades 3 s.h.
Introduction of health education philosophy, current methods, materials, and concepts in grades K-9. Required for Health Education K-9 certification.

28:146 Health Instruction for Secondary Schools 3 s.h.
Introduction to health education philosophy, current methods, materials, and concepts for grades 7-12. Required for Health Education 7-12 certification.

28:149 Elementary School Physical Education 2-3 s.h.
Materials, methods, curriculum planning; opportunities for improving performance skills in all program areas, as well as for teaching experience. Primarily for elementary education majors, junior standing or above. Fall. Same as 7E:121.

28:150 Movement Education 1-2 s.h.
In-depth examination of movement education theory;

practical teaching experience included. Recommended prerequisites: 28:71 and 28:72.

28:152 Women as Leaders arr.
Leadership styles, roles, accomplishments.

28:160 Workshop: Elementary Physical Education 1 s.h.
Summer.

28:161 Sports Information 2 s.h.
Interrelationships between coach, game statistician, athletes, spectators and the media. Introduction of methods and techniques to keep the news media informed about school athletics. Fall.

28:162 Sports Analysis 3-4 s.h.
Thorough understanding of basic skills, strategy, rules, officiating, governing organizations and competitive opportunities in specific sports.

28:163 Sports Analysis 3-4 s.h.
Continuation of 28:162.

28:164 History of Sport 2-3 s.h.
Development of specific sports as influenced by individuals, governing organizations, special commissions and legislation.

28:165 Internships arr.
Individual opportunities to work with athletic teams, sports editors (newspapers, magazines, radio, television) and sports information directors.

28:166 Seminars arr.
Mini-courses with notable persons in sports journalism and/or broadcasting.

28:167 Psycho-Social Dimensions of Sport 2-3 s.h.
Overview of psycho-social factors in sport involvement.

28:168 The Child and Sport 2 s.h.
Effect of organized competition in sports on the developing child.

Primarily for Graduates

28:201 Problems in Physical Education arr.
Prerequisite: consent of instructor.

28:203 Seminar: Current Issues 2, 4 s.h.
Problems in physical education and related areas. Fall.

28:205 Techniques of Research 3-4 s.h.
Introduction to design and interpretation of research.

28:211 Gross Motor Learning 2-3 s.h.

28:213 Assessment of Motor Performance 3 s.h.
Theory and processes for assessment of motor performance; includes preparation of objectives, construction of motor performance tests, interpretation of test results, reliability, validity, mastery learning, and program evaluation.

28:215 Analysis of Human Motion 3 s.h.
Advanced kinesiological study with application to teaching methods and problems in sports, dance, body mechanics, conditioning.

28:216 Physiological Functioning in Physical Education 3 s.h.
Effects of exercise and training on neuromuscular, respiratory and circulatory functioning, and energy systems.

28:218 Advanced Coaching 2 s.h.
Reading and discussion concerning coaching and officiating procedures in light of research and recent developments in women's sports.

28:240 Motor Development of Children 3 s.h.
In-depth examination of selected mechanisms in the development of human motor behavior. Prerequisite: permission of instructor.

28:242 Seminar: Health Concerns of Women 3 s.h.
Summer.

28:243 Philosophical Bases of Curriculum Construction 3 s.h.

28:244 Seminar: Health Education Program 2 s.h.
Planning and using opportunities in physical education for teaching of health.

28:245 Supervision of Physical Education 2 s.h.

28:247 Historical and Philosophical Perspectives of Physical Education 3 s.h.

28:248 Sociology of Sports 2-3 s.h.
Role and meaning of organized sports and individual sport participation in primitive and contemporary cultures. Fall.

28:250 Seminar: Current Developments in Physical Education 2 s.h.

28:252 Individual Differences in Activity Classes 2 s.h.
Modification of activity curriculum to accomodate atypical students; includes discussion on methods of teaching for the low-motor individual and the physically disabled.

28:253 The Law and Sport 2 s.h.

28:254 History of Women in Sports 2 s.h.

28:256 Professional Writing 3 s.h.
Critical review of physical education and related writing of all types; individual projects on writing for publication or presentation at professional meetings.

28:260 Physical Education Program Planning 3 s.h.
Curriculum design, methods of instruction, public relations, legal responsibilites of teachers, and future directions in physical education.

28:299 Independent Research arr.

28:301 Seminar in Research arr.
Special topics for Ph.D. candidates. May be repeated.

28:302 Seminar Perspectives in Human Movement 2 s.h.

28:305 Advanced Kinesiology 2 s.h.
Advanced study of muscle action and laboratory techniques for analysis of muscular action and motor performance. Fall. Prerequisites: anatomy, kinesiology.

28:307 Video Instruction and Research in Physical Education 2 s.h.

28:310 Neuromuscular Bases of Motor Function 3 s.h.
Research in perception and kinesthesis involved in motor learning and skilled performance.

28:311 Seminar: Gross Motor Learning 2 s.h.

28:312 Experiments in Motor Learning 2 s.h.
Designing studies in motor learning at various ages and levels of skill complexity.

28:313 Seminar Evaluation 2 s.h.
Critical examination of current issues and problems in the evaluation of human performances as reflected in research literature and other professional communication. Prerequisite: 28:213.

28:319 Administration in Physical Education 3 s.h.

28:320 Seminar Methods of Teaching Physical Education 2-3 s.h.

28:340 Seminar: Motor Development 2 s.h.
Contemporary theoretical viewpoints of motor development, including discussion of recent research findings which bear on these viewpoints. Prerequisite: permission of instructor.

28:401 Thesis arr.
Prerequisite: consent of instructor.

Dance

Primarily for Undergraduates

28D:6 Modern Dance 1-4 s.h.
Beginning modern dance technique.

28D:8 Major Modern Dance I 2 s.h.
May be repeated. Intermediate modern dance technique. May be repeated for credit.

28D:9 Jazz 1-2 s.h.
Beginning jazz technique.

28D:10 Ballet 1-2 s.h.
Prerequisite: 28D:9 or equivalent experience.

28D:11 Major Ballet I 2 s.h.
May be repeated for credit.

28D:12 Major Ballet II 2 s.h.
Open to those who have completed 28D:9 and 28D:10 or equivalent. May be repeated.

28D:13 Major Ballet III 2 s.h.
Open to those who have completed 28D:12 or equivalent. May be repeated for credit.

28D:20 Social Forms of Dance 1-2 s.h.
Same as 27:20.

28D:21 Introduction to Mexican American Dance 2 s.h.

28D:23 Teaching of Modern Dance 2-4 s.h.

28D:28 Teaching of Modern Dance 2 s.h.
Teaching in secondary schools and at college level.

28D:35 Major Modern Dance II 2 s.h.
Continuation of 28D:28. May be repeated for credit.

28D:36 Major Modern Dance III 2 s.h.
Advanced modern dance technique. Continuation of 28D:35. May be repeated for credit.

28D:91 Independent Study arr.

For Undergraduates and Graduates

28D:111 Methods and Materials of Teaching Children's Dance 3 s.h.
Presenting creative movement experiences for the elementary school child.

28D:112 Rhythmic Analysis of Dance 2 s.h.
Analysis of rhythmic form and its relationship to dance.

28D:113 Ballet Pointe 1-2 s.h.
Intermediate-advanced.

28D:114 History and Appreciation of Dance 3 s.h.
Survey of development of dance from primitive origins to present-day status as a theatrical art; emphasis on changing forms and functions of dance in society.

28D:115 Twentieth Century Dance 3 s.h.
Development of ballet from the end of the Romantic period to the present; history of modern dance and its relationship to ballet.

28D:116 Dance in Education 2-3 s.h.
History and current status of dance at all levels of education.

28D:117 Ballet Pedagogy 2 s.h.
Methods and materials of teaching beginning ballet.

28D:122 Workshop: Artist in Residence 1-4 s.h.

28D:123 Composition I 2 s.h.
Elementary forms of choreography.

28D:124 Composition II 2 s.h.
Continuation of 28D:123.

28D:125 Dance Techniques 1-2 s.h.

28D:126 Advanced Modern Dance 1-2 s.h.
Continuation of 28D:125. May be repeated.

28D:127 Dance Production 1-2 s.h.
Organization and procedures of all aspects of dance production.

28D:128 Dance Production Laboratory 1-2 s.h.
Continuation of 28D:127.

28D:129 Dance Accompaniment 2 s.h.
Overview of music as it pertains to dance; analysis of scores for dance; sources of sound for dance.

28D:130 Improvisation 1 s.h.

28D:140 Introduction to Movement: Dynamics and Personality Growth 2 s.h.

28D:141 Introduction to Movement: Dynamics and Personality Growth 3 s.h.
Introduction to the movement therapy process on the elementary level.

28D:142 Introduction to Movement: Dynamics and Personality Growth 3 s.h.
Continuation of 28D:141.

28D:170 Readings in Dance arr.
By permission only.

28D:171 Dance Company Class 0-1 s.h.
Participation in concert work. By audition only.

28D:172 Dance Company Class 0-1 s.h.
Participation in concert work. By audition only.

28D:173 Composition III arr.
Intermediate choreographic problems. May be repeated. Prerequisite: 28D:123 and 28D:124.

28D:174 Composition IV arr.
Continuation of 28D:173. May be repeated.

28D:175 Dance Theory 3 s.h.
Aesthetics as applied to dance; exploration of the artistic aims and philosophies of dance from the Renaissance to the present.

28D:176 Criticism of Dance 3 s.h.
Survey of the writings of dance critics from the 18th century to the present; practicum in the writing of dance criticism. Prerequisite: 28D:114, 28D:115, or 28D:175.

28D:177 Beginning Labanotation 3 s.h.
Theory and practice of Laban's principles of movement notation.

28D:178 Intermediate Labanotation 3 s.h.
Continuation of 28D:177.

28D:181 Dance Company Class 1-2 s.h.
Participation in concert work. By audition only.

28D:182 Dance Company Class 1-2 s.h.
Participation in concert work. By audition only.

28D:201 Problems in Dance arr.

28D:204 Seminar: Dance 2 s.h.

28D:205 Techniques of Research 3-4 s.h.
Selecting and defining a problem; methods and design of studies.

28D:401 Thesis arr.

Physical Therapy

See "College of Medicine."

Physician's Assistant Program

See "College of Medicine."

Physics and Astronomy

Department head: James A. Van Allen
Associate department head and undergraduate adviser: Edward B. Nelson
Faculty: *professors* Richard R. Carlson, Nicola D'Angelo, Louis A. Frank, Donald A. Gurnett, Noah Hershkowitz, Glenn R. Joyce, William H. Klink, Georg Knorr, Howard I. Laster, Edward B. Nelson, Edwin Norbeck, William R. Savage, William C. Stwalley, James A. Van Allen *professor emeritus* Edward P.T. Tyndall *associate professors* Raymon T. Carpenter, John D. Fix, Chistoph K. Goertz, Edward R. McCliment, John S. Neff, Gerald L. Payne, John W. Schweitzer, Stanley D. Shawhan *adjunct associate professor* Donald C. Enemark *assistant professors* Robert L. Mutel, Dwight R. Nicholson
Degrees offered: B.A. and M.S. in Astronomy; B.A., B.S., M.S., and Ph.D. in Physics

The Department of Physics and Astronomy provides comprehensive and rigorous instruction in all basic aspects of these subjects. In addition it provides research facilities and guidance for individual scholarly work at an advanced level in selected specialities.

Total departmental enrollments are typically 1,200 student registrations during each semester of the academic year and 130 during the summer session. All courses and advanced laboratories are taught by full-time members of the faculty. Senior members of the faculty teach the elementary courses and supervise graduate student assistants who conduct the associated laboratories.

Beyond the elementary level, typical course enrollments are 20, and there is ample opportunity for individual work. Special introductory courses having similar enrollments are offered for majors in physics and for others with special interest in the subject. There are about 65 undergraduate majors—10 of whom are Honors students—and 45 graduate students in physics or astronomy.

About 40 percent of the graduates with bachelor's degrees pursue advanced study. Others find positions in secondary school teaching and in government and industrial laboratories, or use their physics training as the basis for a career in another field.

Graduates of The University of Iowa with M.S. or Ph.D. degrees in physics or astronomy continue to find satisfactory employment in universities, colleges and research laboratories in government and industry, despite a recent national shrinkage in such opportunities.

Undergraduate Major in Physics

The Bachelor of Science program is designed to serve either as preparation for graduate study in physics and related sciences, or as preparation for employment in industry.

The Bachelor of Arts program is designed for students who wish a considerable knowledge of physics but who do not plan a research-oriented career in physics. This degree program can be useful to those planning careers in medicine, law, science-related administration, business, technical writing, or secondary-school science teaching. The B.A. program requires fewer courses in physics and mathematics than the B.S. program, and thus provides for a wider choice of electives.

Bachelor of Science Degree

The following courses or their equivalents are required for the Bachelor of Science degree with a major in physics:

22M:25-26 Calculus I-II	8 s.h.
22M:27 Introduction to Linear Algebra	4 s.h.
22M:28 Calculus III	4 s.h.
or	
22M:35-37 Engineering Calculus I-III	12 s.h.
22M:38 Differential Equations and Linear Algebra	4 s.h.
29:17-19 Introductory Physics I-III	12 s.h.
29:115 Intermediate Mechanics	3 s.h.
29:116 Introductory Quantum Mechanics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:129-130 Electricity and Magnetism	6 s.h.
29:132 Intermediate Laboratory	4 s.h.
29:191 Atomic Physics (2 semesters)	3 s.h.

Two additional courses, one of them at the 190-level, selected from 29:117, 29:128, 29:132 (an additional semester), 29:171, 29:191, 29:192, 29:193, and 29:194; and
An additional five s.h. of introductory coursework in another science or engineering field.

Undergraduate majors who plan to pursue graduate study are advised to go beyond the minimum requirements given above to the greatest feasible extent, including further work in mathematics.

Bachelor of Arts Degree

The following courses or their equivalents are required for the Bachelor of Arts degree with a major in physics:

22M:25-26 Calculus I-II	8 s.h.
or	
22M:35-36 Engineering Calculus I-II	8 s.h.
29:17-18 Introductory Physics I-II	8 s.h.
or	
29:11-12 College Physics	8 s.h.
29:19 Introductory Physics III	4 s.h.
29:115 Intermediate Mechanics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:128 Electronics	4 s.h.
or	
29:129 Electricity and Magnetism	3 s.h.
29:132 Intermediate Laboratory (2 semesters)	4 s.h.

An additional 12 s.h. or more of science in a single thematic area as approved by the student's adviser.

Undergraduate Major in Astronomy

Astronomy includes the subdisciplines of astrophysics, classical astronomy, radio astronomy and space astronomy. A balanced and integrated program of astronomy, physics and mathematics courses is required for the Bachelor of Arts degree in astronomy. The purpose of this program is to prepare the student for a career or advanced study in astrophysics, radio astronomy or space astronomy.

The following courses or their equivalents are required for the Bachelor of Arts degree with a major in astronomy:

22M:25 Calculus I	4 s.h.
22M:26 Calculus II	4 s.h.
22M:27 Introduction to Linear Algebra	4 s.h.
22M:28 Calculus III	4 s.h.
or	
22M:35-37 Engineering Calculus I-III	12 s.h.
22M:38 Differential Equations and Linear Algebra	4 s.h.
29:17-19 Introductory Physics I-III	12 s.h.
29:61-62 General Astronomy	8 s.h.
29:115 Intermediate Mechanics	3 s.h.
29:116 Introductory Quantum Mechanics	3 s.h.
29:119-120 Introduction to Stellar Astrophysics I-II	6 s.h.
29:129-130 Electricity and Magnetism	6 s.h.
29:132 Intermediate Laboratory (2 semesters)	2 s.h.
29:137 Astronomical Laboratory	2 s.h.
29:191 Atomic Physics	3 s.h.

Undergraduate majors in astronomy who plan to pursue graduate study in astrophysics are advised to go beyond the minimum requirements listed above to the greatest feasible extent, and take:

29:117 Optics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:171-172 Mathematical Methods of Physics	6 s.h.

For general requirements of the College of Liberal Arts, see "College of Liberal Arts."

Honors

Selected junior and senior majors may take six to eight semester hours of 29:99 Honors Seminar and conduct an investigation with the guidance of a faculty member as part of their program for the degree, Bachelor of Arts or Bachelor of Science with Honors in physics or astronomy.

Graduate Program

Two advanced degrees are offered in physics, the Master of Science (with or without thesis) and the Doctor of Philosophy; and one in astronomy, the Master of Science (with or without thesis). A student who wishes to pursue a program in astronomy beyond the M.S. level may qualify for a Doctor of Philosophy degree in physics with specialization and a dissertation in astronomy or astrophysics.

An M.S. degree is not prerequisite to the Ph.D.

The Department of Physics and Astronomy cooperates in interdisciplinary doctoral programs with the Program in Applied Mathematical Sciences (see "Graduate College").

An interdepartmental program leading to the M.S. and Ph.D. degrees in chemical physics is also available.

Each entering graduate student is assigned to a faculty adviser who will assist in preparing a plan of study and in guiding the student's progress. A graduate student becomes a candidate for an advanced degree in physics or astronomy only after passing a qualifying examination in all principal areas of the subject at the level of advanced undergraduate work. The examination is given during the first week of the second semester each year and must be taken by all first-year graduate students. After a student has selected a research specialty, the appropriate thesis or essay adviser then becomes the candidate's general adviser and the chair of the final examination committee.

Master of Science Degree in Physics

The M.S. degree is offered with thesis or without thesis. Either degree may be an intermediate step toward a Ph.D. degree, or it may be a terminal degree. The final examination in either case is an oral one conducted by a committee of three members of the graduate faculty appointed by the dean of the Graduate College.

The program for the M.S. degree with thesis requires 30 semester hours of graduate work and a thesis based on an original experimental or theoretical investigation by the candidate. No more than six of the required 30 semester hours may be for research (29:281 Research Physics).

The program for the M.S. degree without thesis requires 30 semester hours of graduate work, an independent study of the literature on a chosen topic and the preparation of a critical essay on that topic. No more than four of the minimal 30 semester hours may be for the critical essay (29:220 Individual Critical Study). Up to one-third of the graduate program may be in related scientific fields other than physics and mathematics, e.g., chemistry, astronomy, engineering, etc.

The candidate for either of the M.S. degrees must have satisfactorily completed the following courses or their equivalents as an undergraduate or a graduate:

29:115 Intermediate Mechanics	3 s.h.
29:116 Introductory Quantum Mechanics	3 s.h.

29:117 Optics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:129-130 Electricity and Magnetism	6 s.h.
29:133 Advanced Laboratory (2 semesters)	4 s.h.
29:171-172 Mathematical Methods of Physics	6 s.h.
29:191 Atomic Physics	3 s.h.
29:192 Nuclear Physics	3 s.h.
29:193 Introductory Solid State Physics	3 s.h.

The student's plan of study should provide for as much advanced work as aptitude and previous preparation permit.

Master of Science Degree in Astronomy

The M.S. degree is offered with thesis or without thesis. The general requirements are the same as for the M.S. in Physics (see above). Course requirements:

29:115 Intermediate Mechanics	3 s.h.
29:116 Introductory Quantum Mechanics	3 s.h.
29:117 Optics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:119-120 Introduction to Stellar Astrophysics I-II	6 s.h.
29:121 Solar System Astrophysics	3 s.h.
29:129-130 Electricity and Magnetism	6 s.h.
29:133 Advanced Laboratory	2 s.h.
29:137 Astronomical Laboratory	2 s.h.
29:171-172 Mathematical Methods of Physics	6 s.h.
29:191 Atomic Physics	3 s.h.

A student who intends to continue for a Ph.D. in physics with an astrophysics specialization should take the following courses as soon as possible:

29:131 Radioastronomy	3 s.h.
29:232-233 Theoretical Astrophysics I-II	6 s.h.
29:234 Stellar Structure and Evolution	4 s.h.
29:235 Special Topics in Astrophysics	2 s.h.
29:263 Seminar: Astrophysics	arr.

Doctor of Philosophy Degree in Physics

The program of study for the Ph.D. degree with major in physics includes:

Thorough coursework in both classical and modern theoretical physics for all candidates, whether their specialized research is to be in an experimental or a theoretical area;
Comprehensive examinations;
Participation in advanced seminars;
Original research in experimental physics, theoretical physics or astrophysics; and
Preparation and defense of a written dissertation based on this work.

All candidates for the Ph.D. must take at least 27 semester hours of 200-level courses in the Department, excluding 29:220, 29:281 and seminars. The following minimum program is recommended as preparation for the comprehensive examinations:

29:191 Atomic Physics	3 s.h.
29:192 Nuclear Physics	3 s.h.
29:193 Introductory Solid State Physics	3 s.h.
29:205 Classical Mechanics	3 s.h.
29:212 Statistical Mechanics I	3 s.h.
29:213-214 Classical Electrodynamics	6 s.h.
29:245-246 Quantum Mechanics I-II	6 s.h.

Advanced mathematics, such as the theory of functions of a complex variable and vector and tensor analysis, is used freely in these courses. An introduction to these fields is given in 29:171-172 Mathematical Methods of Physics. The selection of less advanced courses will depend on the adequacy of the student's preparation for graduate work; the student's choice of more advanced and specialized courses will depend on the direction in which his or her interests develop. No more than 30 of the minimal 72 semester hours may be in research and seminars.

A candidate for the Ph.D. degree will not be recommended for the degree until he or she has written the dissertation in proper form for formal publication and has submitted it, with the approval of the research adviser, for publication to a standard scientific journal of wide distribution.

Research

The Department has an excellent library and a number of well-equipped laboratories and observatories. The associated facilities of the University Computer Center are available for research by students and staff of the Department, and several other computers are available within the Department. The central machine shop is fully equipped and staffed with skilled instrument makers and machinists, and there are several electronics and machine shops for the use of advanced students and the research staff.

Experimental research is conducted in astronomy (optical and radio); low energy nuclear physics; plasma physics; solid state physics; magnetospheric physics; solar-terrestrial, interplanetary and planetary physics; and acoustics of musical instruments.

A major experimental space physics program is conducted in the Department. Extensive facilities are available for construction of equipment for satellites and spacecraft, for the reception of satellite telemetry, and for computerized decoding and analysis of data. An unusually versatile 6.0-MV Van de Graaff accelerator, which has been modified for energies up to 14 MeV, is used in studies of nuclear reactions induced by hydrogen, helium, lithium, and beryllium nuclei. Experiments on fundamental thermal, electrical, and magnetic properties of metals, alloys, and compounds are included in the experimental solid state program, as are surface studies of metals and semiconductors. Several experimental double plasma devices are used to study confinement, nonlinear waves, and turbulence effects in low temperature steady state plasmas.

Research is conducted in observational astronomy. The research observatory is well equipped for photometric and spectroscopic observations. The primary instrument, a 24-inch reflector with a scanning spectrometer, is used for stellar and cometary studies. Research programs are carried out on the 18.3-meter parabolic reflector located at the North Liberty Radio Observatory near Iowa City. Current long-term research activities include intercontinental VLBI and spectral studies of OH masers. A 34-MHz Mills Cross array, one of the largest radio telescopes in the world, located at Clark Lake in California, is available for studies of the interplanetary medium.

Theoretical research is devoted to elementary particles and high energy physics; plasma physics; astrophysics; atmospheric, space, and planetary physics; solid state physics; and nuclear physics.

Persons qualified for graduate study are invited to apply for fellowships and assistantships. Inquiries should be directed to the head of the Department.

Courses

Physics

Prerequisites and corequisites are specified as guides and may be waived by the instructor.
An elementary course may not be repeated for credit or for quality points if the student has already completed a higher level course for which the elementary course, or its equivalent, is a prerequisite.
Courses 29:5, 29:8, 29:11-12, 29:17-18, 29:50, and/or 29:61-62 are accepted toward the College of Liberal Arts core requirement in the natural sciences.

Primarily for Undergraduates

29:4 Beginning Physics 2 s.h.
Three lectures per week, no laboratory. Intended primarily for students in medically related fields. Covers mechanics, properties of fluids, heat, electricity and magnetism, electrical instruments, sound, light and modern physics. Not open to students who have received credit for 29:8 or 29:11. Prerequisite: high school algebra.

29:5 Chemistry and Physics of the Environment 4 s.h.
Fundamental discussion and clarification of chemistry and physics of ecology of our planet; air, earth, water and noise pollution, return of pollutants to man, chemistry and physics of balance of nature; all relevant principles of physics and chemistry at elementary level. No prerequisites. For nonscience students. Same as 11:25.

29:6 Practical Electricity and Electronics 3 s.h.
Basic principles and practical experience necessary to cope with our environment; topics include: the nature of electricity; electrical circuits; electromagnetism; generation and distribution of electricity; the oscilloscope; transistors; amplifiers; radio and TV; sound recording and reproduction; electrical control systems. Each class meeting combines lecture, discussion, demonstration, and laboratory sessions.

29:8 Basic Physics 4 s.h.
Quantitative treatment of mechanics, electricity, heat, liquids and gases with emphasis on useful applications. Meets one-semester physics requirements. Prerequisite: not open to students who have received credit for 29:11.

29:11 College Physics 4 s.h.
29:11 and 29:12 comprise a complete introductory course in physics. Lectures, laboratory and problem work in mechanics, heat and sound. Prerequisite or corequisite: 22M:2 or equivalent.

29:12 College Physics 4 s.h.
Electricity, magnetism, light, and modern physics. Continuation of 29:11, which is prerequisite.

29:17 Introductory Physics I 4 s.h.
Mechanics, heat and sound. Recommended for majors in physics, astronomy, and other sciences, and for Honors students. Prerequisite or corequisite: 22M:25 or 22M:35 or equivalent.

29:18 Introductory Physics II 4 s.h.
Electricity, magnetism, and light. Continuation of 29:17.

29:19 Introductory Physics III 4 s.h.
Atomic and nuclear physics and relativity. Continuation of 29:18.

29:82 Physics I 3 s.h.
Unifying principles of mechanics, electricity and magnetism; relativity; introduction to quantum mechanics and atomic physics. Primarily for junior engineering students. Prerequisite: 540:25 or equivalent.

29:83 Physics II 3 s.h.
Quantum mechanics; atomic and molecular structure; solid state physics; nuclear physics. Primarily for engineering students. Continuation of 29:82. Prerequisite: 29:82 or equivalent.

29:93 Reading in Physics arr.
Consult head of Department before registering.

29:98 Undergraduate Seminar 2 s.h.
Reading and discussion on a selected topic in physics or astronomy under guidance of an instructor. The topic and instructor will be announced in advance of each semester. May be repeated.

29:99 Honors Seminar arr.
Supervised original research project leading to written report and oral defense. For junior and senior Honors candidates majoring in physics or astronomy.

For Undergraduates and Graduates

29:103 Reading in Physics arr.
Consult head of Department before registering.

29:109 Modern Physics 3 s.h.

29:113 Physics of Sound and Music 3 s.h.
Properties of sound waves and propagation, reflection and absorption; production of sound by voice and musical instruments; musical scales; mechanical and electronic generation, recording and reproduction of sound; descriptive course. No mathematical prerequisites. Same as 25:295.

29:115 Intermediate Mechanics 3 s.h.
Simple and damped harmonic motion; small oscillations; Lagrange's equations of motion; central force motion; rigid body rotations.

29:116 Introductory Quantum Mechanics 3 s.h.
Introduction to the mathematics of quantum mechanics; state functions and their interpretations; Schrödinger equation; states of a particle in one dimension; systems of particles in one dimension; central potential; angular momentum states. Prerequisites: 29:115 and 22M:26 or equivalent.

29:117 Optics 3 s.h.
Geometrical and physical optics; properties of lenses and simple optical instruments; phenomena of propagation, interference, diffraction and polarization of light; see 29:132 for laboratory work.

29:118 Statistical Physics 3 s.h.
Integrated introduction to the subjects of thermodynamics, statistical mechanics and kinetic theory with emphasis on applications.

29:127 Electricity and Electrical Measurements 3 s.h.
Electrical circuits, measurements, and electronics. Introduction to electromagnetic fields. Two lectures and one laboratory each week. Prerequisites: 29:12 or 29:18 and 22M:26 or 22M:36.

29:128 Electronics 4 s.h.
Characteristics of bipolar and FET transistors and integrated circuit devices such as op-amps, PPLs, TTL and CMOS logic; design and study of analog and digital circuits and instrumentation with emphasis on laboratory work. Prerequisite: 29:12, 29:18 or equivalent experience.

29:129 Electricity and Magnetism 3 s.h.
Electrostatics, magnetic fields, and introduction to Maxwell's equations. See 29:132 for laboratory work. Prerequisite: 22M:26 or equivalent.

29:130 Electricity and Magnetism 3 s.h.
Magnetism, electromagnetic waves, A.C. circuits and applications of Maxwell's equations to wave guides, antennas, optics, plasma physics and other selected topics; continuation of 29:129, which is prerequisite. See 29:132 for laboratory work.

29:132 Intermediate Laboratory 2 s.h.
Laboratory work in electricity, magnetism and electronics; atomic, nuclear and solid state physics; optics; spectroscopy. May be repeated.

29:133 Advanced Laboratory 2 s.h.
Laboratory work in diverse areas of modern physics. May be repeated.

29:138 Digital Electronics, Microprocessors and Microcomputers 3 s.h.
Introduction to microprocessor-based systems; number systems, integrated circuit logic design, microprocessor organization, memories, interfacing, I/O terminals, peripheral devices, instruction sets and programming for the small computer. Two lectures and one laboratory per week. Prerequisite: previous coursework in digital circuits and Boolean algebra. Assembly programming skill helpful.

29:157 Physics for Artists 2 s.h.
Discussion and laboratory course for nonscience students; study of properties of many different kinds of waves leading to understanding of holography. No prerequisites.

29:158 Physics for Artists 2 s.h.
Study of many aspects of production and detection of color. Continuation of 29:157 which, however, is not prerequisite.

29:171 Mathematical Methods of Physics 3 s.h.
Functions of complex variables, integration methods, linear vector spaces and matrix algebra. Prerequisite: 22M:28 or 22M:38.

29:172 Mathematical Methods of Physics 3 s.h.
Hilbert space, special functions, Fourier transform and expansions in orthogonal polynomials, differential equations and Green's functions. Continuation of 29:171.

29:191 Atomic Physics 3 s.h.
Atomic and molecular structure; optical spectra and selection rules; one- and two-electron atoms; multi-electron atoms; multiplets; fine structure; Zeeman effect; hyperfine structure; molecular vibration and rotation spectra. See 29:133 for laboratory work. Prerequisite: 29:116 or equivalent.

29:192 Nuclear Physics 3 s.h.
Nuclear masses, radioactivity, alpha-, beta- and gamma-ray spectra, nuclear energy levels and nuclear structure, nuclear reactions, the neutron, fission and fusion reactions, passage of radiations through matter, mesons and elementary particles, experimental techniques. See 29:133 for laboratory work. Prerequisite: 29:116 or equivalent.

29:193 Introductory Solid State Physics 3 s.h.
Phenomena association with the solid state; classification of solids and crystal structures, electronic and vibrational processes in solids; thermal, optical, magnetic and dielectric properties of solids. See 29:133 for laboratory work. Prerequisites: 29:116 and 22M:26 or equivalent.

29:194 Plasma Physics 3 s.h.
Physics of ionized gases including orbit theory, guiding center motion, adiabatic invariants; description of plasmas by fluid variables and distribution functions; linearized wave motions and instabilities; magnetohydrodynamics and MHD shock waves. Prerequisites: 29:130 and knowledge of vector analysis.

29:195 Plasma Physics 3 s.h.
Linear and nonlinear solutions of the Vlasov equation, kinetic theory of plasmas. Continuation of 29:194.

Primarily for Graduates

29:205 Classical Mechanics 3 s.h.
Dynamics of mass points; Lagrange's and Hamilton's equations; canonical transformations and Hamilton-Jacobi theory. Prerequisite: 29:115.

29:211 Mechanics of Continua 3 s.h.
Hydrostatics, dynamics of ideal fluids, both incompressible and compressible; viscous flow; classical theory of elasticity. Prerequisites: 29:205 and 29:172 or the equivalent.

29:212 Statistical Mechanics I 3 s.h.
Problem of Boltzmann; H-theorem and general principles of classical statistical mechanics; specific heat theory and nonideal gases; stochastic processes; Einstein-Bose and Fermi-Dirac statistics and applications. Prerequisites: 29:116, 29:118, and 29:172 or the equivalent.

29:213 Classical Electrodynamics 3 s.h.
Advanced electromagnetostatics, boundary value problems, Green's functions, Maxwell's equations, radiation theory, physical optics and multipole expansion of radiation field. Prerequisites: 29:130 and 29:172 or equivalent.

29:214 Classical Electrodynamics 3 s.h.
Special relativity, motion of charges in fields, theories of radiation reaction and special topics. Prerequisite: 29:213.

29:220 Individual Critical Study arr.
Essay written on topic chosen in consultation with faculty member. For candidates for M.S. degree without thesis in physics or astronomy.

29:245 Quantum Mechanics I 3 s.h.
Nonrelativistic quantum mechanics; Schrodinger wave mechanics, Hilbert space methods; perturbation theory; scattering; spin and angular momentum; identical particles; selected applications; introduction to relativistic theory. Prerequisites: 29:172 and 29:191.

29:246 Quantum Mechanics II 3 s.h.
Continuation of 29:245.

29:249 Advanced Nuclear Physics 3 s.h.
Phenomena of nuclear physics and their interpretation; static properties of nuclei, nuclear moments, shell model, collective model, gamma-transitions, beta-decay, nuclear reaction mechanisms, and other topics. May be repeated. Prerequisites: 29:192 and 29:245.

29:261 Seminar: Plasma Physics arr.
Discussion of current research. Same as 547:291.

29:262 Seminar: Solid State Physics arr.
Discussion of current research.

29:264 Seminar: Teaching of Physics and Astronomy arr.

29:265 Seminar: Theoretical Physics arr.
Discussion of current research.

29:266 Seminar: Space Physics arr.
Discussion of current research.

29:267 Seminar: Nuclear Physics arr.
Discussion of current research.

29:271 Theoretical Solid State Physics 3 s.h.
Central principles of the quantum theory of solids; lattice dynamics, electronic structure, optical properties, many-body effects, superconductivity, magnetism and other topics; emphasis on viewpoint of elementary excitations. May be repeated. Prerequisites: 29:193 and 29:246.

29:273 General Relativity and Cosmology 3 s.h.
Einstein's theory of gravitation; applications to astrophysics and cosmology. May be repeated.

29:274 Statistical Mechanics II 3 s.h.
Advanced topics in statistical mechanics; content may vary from year to year, e.g., foundations of kinetic theory and nonequilibrium statistical mechanics or quantum statistical mechanics. May be repeated.

29:276 Special Topics in Quantum Mechanics 3 s.h.
Includes relativistic wave mechanics, second quantization of wave fields, Feynman diagrams, quantum electrodynamics, S-matrix theory and dispersion relations; selected applications in solid-state and nuclear physics also discussed.

29:278 Solar-Terrestrial Physics 2 s.h.
Atmosphere of the sun and radio and particle emissions therefrom; solar wind; origin and nature of the geomagnetic field; the upper atmosphere of the earth; magnetospheres of the earth and other planets; propagation of energetic particles in the interplanetary medium and their access to the earth. Emphasis varies from year to year. May be repeated.

29:281 Research Physics arr.
Prerequisite: consent of head of Department.

29:294 Advanced Plasma Physics I 3 s.h.
Statistical mechanics of plasmas; Liouville equation; BBGKY hierarchy; Fokker-Planck equation and relaxation processes; Balescu-Lenard equation; Vlasov equation and linearized wave motion; shocks, nonlinear plasma motions and instabilities; fluctuations and radiation processes; magnetohydrodynamics; recent papers. May be repeated. Prerequisite: 29:212, 29:213, or consent of instructor.

Astronomy

See explanatory notes under Physics section.

Primarily for Undergraduates

29:50 Modern Astronomy 4 s.h.
Survey of astronomy; special attention given to topics of current interest such as planetary exploration, space astronomy, pulsars, quasars, black holes and cosmology; discussion-laboratory sessions for astronomical observation and problem solving.

29:61 General Astronomy 4 s.h.
Open to freshmen; descriptive lectures and study of astronomical techniques and of all components of solar system: sun, earth, moon, planets and satellites, meteors, comets, energetic particles and interplanetary medium; also time and the calendar, scientific spacecraft and current space investigations, observational work with telescopes and problem work. Prerequisites: at least one year each high school algebra and geometry.

29:62 General Astronomy 4 s.h.
Structure and properties of stars and stellar systems, stellar evolution, the interstellar medium; radio, X-ray, and infrared observations, external galaxies, and modern cosmology. Emphasis on recent astronomical research. Continuation of 29:61, which, however, is not prerequisite. Prerequisites: at least one year each high school algebra and geometry.

29:94 Reading in Astronomy arr.
Consult head of Department before registering.

For Undergraduates and Graduates

29:104 Reading in Astronomy arr.
Consult head of Department before registering.

29:105 General Astronomy 4 s.h.
Abridged course offered only in summer session. Primarily for secondary and high school teachers of science. Prerequisite: same as for 29:61.

29:110 Astronomy Workshop 3 s.h.
Introduces the basic ideas and concepts of astronomy and is designed especially for prospective and in-service teachers and others who have not previously studied astronomy.

29:119 Introduction to Stellar Astrophysics I 3 s.h.
Fundamentals of astronomy and stellar spectroscopy; properties of visual, spectroscopic and eclipsing binary stars; stellar atmospheres and interiors; stellar kinematics and dynamics; distance indicators and application to investigation of structure of galaxy and extragalactic systems. Offered 1978-79, alternate years. Prerequisites: 29:18 and 22M:26 or equivalent.

29:120 Introduction to Stellar Astrophysics II 3 s.h.
Continuation of 29:119. Offered 1978-79, alternate years. Prerequisites: 29:19 and 22M:26 or equivalent.

29:121 Solar System Astrophysics 3 s.h.
Planetary surfaces, interiors and atmospheres; comets, meteors and asteroids; interplanetary environment; moon; origin and evolution of solar system. Offered 1979-80, alternate years. Prerequisites: 29:19 and 22M:26 or 22M:36 or equivalent.

29:131 Radioastronomy 3 s.h.
Fundamental theory and observational techniques in radio astronomy. Overview of current research results in areas of solar and planetary emissions; galactic sources such as HI and HII clouds, interstellar molecules, flare stars and pulsars; extragalactic objects such as quasars and Seyfert galaxies; and experimental cosmology. Offered 1979-80 and alternate years.

29:137 Astronomical Laboratory 2 s.h.
Advanced laboratory work and observation with 24-inch telescope; techniques of astronomical photography, photometry and spectroscopy; laboratory work in data reduction, instrument calibration and numerical computation. May be repeated. Prerequisites: 29:62 and consent of instructor.

29:232 Theoretical Astrophysics I 3 s.h.
Theory of stellar photospheres and continuous spectra of stars; formation of absorption lines in spectra of stars. Offered alternate years. Prerequisite: consent of instructor.

29:233 Theoretical Astrophysics II 3 s.h.
Interstellar matter, nebulae, novae and galactic radiation. Offered alternate years. Continuation of 29:232.

29:234 Stellar Structure and Evolution 4 s.h.
Structure of stellar interiors; nuclear genesis and nucleosynthesis in stars and evolution of stars. Offered alternate years. Prerequisite: consent of instructor.

29:235 Special Topics in Astrophysics 2 s.h.
Advanced lectures on one or more of the following topics: black holes, computational methods in astrophysics, high energy astrophysics, radio astronomy and celestial mechanics. Offered when demand warrants. May be repeated.

29:263 Seminar: Astrophysics arr.
Discussion of current research.

29:282 Research Astronomy arr.
Original research in observational and theoretical astronomy.

Political Science

Department chair: Peter G. Snow
Faculty: *professors* G. Robert Boynton, Lane Davis, Donald Johnson, Hugh Kelso, Chong Lim Kim, Gerhard Loewenberg, James Murray, Samuel C. Patterson, Russell Ross, Peter Snow, Vernon Van Dyke, John Wahlke, William Welsh
associate professors Joel Barkan, Andrew Cowart, Douglas Madsen, Donald McCrone
assistant professors Michael Lewis-Beck, Charles Lucier, John Nelson
instructor Greg Caldeira
Degrees offered: B.A., B.S., M.A., Ph.D.

The program in Political Science deals with general principles of human behavior and organization which enable one to understand and explain political situations, events,

and problems. Both the undergraduate and graduate programs in political science emphasize broad and comprehensive study, rather than narrow specialization on restricted aspects of the subject.

Undergraduate Programs

At the undergraduate level the study of political science is general and not vocational. Undergraduate Political Science majors often enter careers in law, public service, or teaching; others enter business, journalism, or medicine. In addition to the B.A. and B.S. majors the Department offers a special teaching major.

Bachelor of Arts

Undergraduates seeking a B.A. degree must meet the following requirements:

(1) At least 27 semester hours of work in political science, including:

30:1 Introduction to American Politics
or
30:2 Introduction to Politics

Two of these:

30:30 Introduction to Political Theory
30:40 Introduction to Comparative Politics
30:50 Introduction to Political Behavior
30:60 Introduction to World Politics

At least 15 semester hours in political science courses numbered 100 or above.

(2) At least 12 semester hours in one of these departments: Economics, Geography, History, Journalism, Philosophy, Psychology, Sociology, Anthropology, or Literature, Science, and the Arts.

A grade-point average of at least 2.0 in all political science courses taken at The University of Iowa, and in all courses in the related departmental area of concentration.

Transfer students must take at least nine of the 27 semester hours of work in political science at The University of Iowa.

Political science courses and courses in the related field may not be taken on a pass-fail basis.

Bachelor of Science

Requirements for the B.S. in political science are the same as for the B.A., except for the following: 1) only two semesters of a foreign language are required; 2) in requirement (2) Linguistics replaces Journalism, and Literature, Science, and the Arts is excluded; and 3) the student must take three semesters of mathematics or statistics.

Courses recommended for the mathematics/statistics requirement:

22M:25-26 Calculus I-II
22S:102 Introduction to Statistical Methods
22S:148 Intermediate Statistical Methods

Other courses may be used, with the written approval of the director of undergraduate studies in Political Science.

Teaching Major

Undergraduates planning to teach in the social sciences with an emphasis on political science must meet these requirements:

(1) Same political science course requirements as for the B.A. and B.S., except that the minimum requirement in political science courses numbered above 100 is eight semester hours.

(2) Twelve semester hours of courses in each of two of these areas: American history, anthropology, economics, geography, psychology, and sociology.

(3) Completion of the sequence of professional education courses leading to certification (see "College of Education").

Honors in Political Science

The Department also has a program leading to a B.A. degree with Honors. It is open to a limited number of students with a minimum general grade-point average of 3.0 on at least 12 semester hours of work in political science. To graduate with Honors, the student must maintain a grade-point average in political science of at least 3.2 and a general grade-point average of at least 3.0. Honors students must take 30:180 Honors Introduction to Political Inquiry and must complete at least two semesters of work in the advanced 30:182-183 Honors Seminar with a grade of B or better each semester. Students interested in seeking a B.A. degree with Honors should contact the departmental Honors adviser prior to the beginning of the junior year.

Graduate Programs

At the graduate level, the Department emphasizes the program leading to the degree of Doctor of Philosophy in political science, which is particularly appropriate for students planning a scholarly academic career; and the Master of Arts in Public Affairs program, which is designed for students who wish to prepare for careers in government service, public affairs, or civic education teaching in secondary schools or junior and community colleges. The general Master of Arts degree is normally pursued by persons whose ultimate degree objective is the Ph.D.

Master of Arts in Public Affairs

Although all students in the public affairs program must take the core courses indicated in the schedule below, elective opportunities make possible several areas of specialization. Students interested in public administration may use their elective credit to take further courses in municipal, state, or financial administration; administrative theory and behavior; or quantitative analysis. Students interested in public policy analysis may use their elective credit to take courses in quantitative research methods, and courses dealing with substantive policy fields such as economic policy, health policy, natural resources policy, or social policy.

This is a nonthesis program. The student must complete at least 36 hours of coursework with at least a 3.0 grade-point average, and must pass a written final examination. Although the schedule suggested below implies completion within a year, the program is sufficiently flexible to accommodate students who may require additional time to meet all degree requirements.

Fall Semester

30:222 American Public Policies	3 s.h.
30:220 Administrative Theory and Public Policy	3 s.h.
Electives	9 s.h.

Spring Semester

30:121 Urban Administration	3 s.h.
30:323 Comparative Public Policy Analysis	4 s.h.
6E:119 Economics of the Government Sector	3 s.h.

Electives	5 s.h.

Summer Session

30:391 Internships in Public Policy and Administration	3 s.h.
30:392 Practicum in Public Policy and Administration	3 s.h.
Elective	3 s.h.
Total	36 s.h.

Students are expected to choose at least one elective numbered 200 or above. In addition to a wide range of options in political science, the student may choose electives including economics, business administration, urban and regional planning, sociology, geography, higher education, social studies education, civil engineering, and law.

Master of Arts with Thesis

Except for the M.A. in public affairs and the M.A. offered under a joint program with the College of Law (see "College of Law"), the Department normally offers the M.A. only as a preliminary step toward the Ph.D. It does not recommend a general M.A. program for students who do not intend to continue for the Ph.D.

The M.A. degree is normally obtained by completing at least 30 semester hours with a grade-point average of at least 3.0, submitting a thesis, and passing a final oral examination. No more than eight semester hours of credit for thesis preparation will be counted toward the 30-semester-hour minimum requirement for the general M.A.

The final oral examination covers both thesis and coursework.

M.A. Without Thesis

If a student's first-year evaluation committee finds that his or her coursework and research papers provide sufficient evidence of the research and writing skills ordinarily demonstrated in a master's thesis, it may recommend that he or she be allowed to proceed with a doctoral program without writing a thesis. The requirements for the M.A. without thesis include completion of at least 30 semester hours with a grade-point average of at least 3.0 and review of the student's record by a final examination committee, which may waive the final oral examination.

The same requirements apply where a first-year evaluation committee finds the quality of a student's work inadequate for recommending continuation toward the Ph.D. but adequate for proceeding with the master's program, and recommends that the student be permitted to seek the nonthesis M.A. as a terminal degree.

Doctor of Philosophy Program

Students are encouraged to seek the Ph.D. only after they have demonstrated their scholarly competence over at least two semesters of graduate study. Requirements for the Ph.D. include completion of at least three academic years in residence and 72 semester hours of graduate-level credit, including work for the M.A. and transfer credits; receipt of the M.A. degree; at least one semester each of special supervised training in teaching and in research; demonstrated command of appropriate research skills; passage of a comprehensive examination; preparation of a dissertation; and the final examination.

The Tool Requirement

The student seeking a Ph.D. degree must demonstrate command of one foreign language or other tool of research, selected with the approval of the doctoral committee. If the tool is other than a foreign language, the student's doctoral committee will specify the criteria to determine whether the requirement has been met. The tool requirement must be met before the student takes the comprehensive examination.

Comprehensive Examination

Students must take the comprehensive examination after completing the sixth semester of residence, or in the first examination period following their attainment of 45 hours of graduate credit, whichever comes later.

Candidates for the Ph.D. take written examinations in three of these areas:

American Politics
Comparative Politics
International Politics
Political Theory
Public Policy and Administration
Philosophy and Methods of Political Research

Before taking the written examinations, candidates must present a written dissertation proposal, and must explain and defend the proposal in an oral examination, which may also deal with any matter relevant to the written examinations.

Teaching and Research Training

Each Ph.D. candidate in political science must take at least one semester of special supervised training in teaching and in research. This instruction is normally given in association with the student's service as a teaching or research assistant.

Dissertation

Not more than 30 semester hours of credit are granted for the preparation of dissertations, and students may not register for credit for reading or research solely for work on their dissertations.

Further Information

A comprehensive statement of departmental requirements is set forth in the *Guide to Graduate Study in Political Science*. For general graduate admission and degree requirements, see "Graduate College."

Special Facilities

The Laboratory for Political Research provides logistical and technical support for undergraduate and graduate teaching and research programs undertaken by the Department of Political Science. The laboratory assists faculty members in utilizing quantitative data and the computer for their undergraduate instruction. This assistance is provided to social scientists at The University of Iowa and at 12 other institutions which make up the Iowa Regional Computer Network. The laboratory is an integral part of graduate education in the Department, and is involved at every level of advanced study.

The Social Science Data Archive holds more than 450 data collections, and the laboratory is a user contact site for data from the 1970 United States Census. The facilities of the laboratory include a card-reader/line-printer, two communications terminals, three card punches, and a counter-sorter. The laboratory also supervises the College of Liberal Arts Mini-Computer Terminal Center for the social sciences, which houses

terminals for access to one of the University's Hewlett-Packard 2000F educational computers.

The Comparative Legislative Research Center of the Department of Political Science was established to promote comparative studies of legislative institutions and behavior in a wide variety of political systems. The main activities of the Center include bibliographic and archival work, data collection, collaborative research with foreign scholars, training of students in legislative research, conferences and seminars, and publication of research. The Center also publishes the *Legislative Studies Quarterly*.

Courses

Introductory Undergraduate

30:1 Introduction to American Politics 4 s.h.
Dynamics of national politics in institutional setting. Fulfills Iowa teacher certification requirement. Open to freshmen and sophomores only.

30:2 Introduction to Politics 4 s.h.
Basic elements and principles of politics, illustrated with reference to many different countries and settings; introduction to concepts and terminology of political science, and to basic approaches used in the field. Open to all undergraduates.

30:30 Introduction to Political Theory 4 s.h.
Illustrates problems, literature, and analytic techniques common in the study.

30:40 Introduction to Comparative Politics 4 s.h.
Comparison of several European, Asian, African, or Latin American systems of government (depending on semester); emphasis on similarities and differences among political parties, interest groups, legislative and executive institutions, policy-making processes, and patterns of voting behavior and citizen participation.

30:50 Introduction to Political Behavior 4 s.h.
Patterns and bases of political attitudes and behavior in public, organizational and institutional settings; laboratory exercises in elements of political behavior research.

30:60 Introduction to World Politics 4 s.h.
Major world regions and contemporary problems of international relations.

30:80 Honors Introduction to Political Science 4 s.h.
Introduction to problems, methods and findings in various subjects of political science. Subject areas emphasized—American politics, comparative government, political behavior, world politics, and political theory—will vary from semester to semester. Open to all freshman and sophomore Honors students.

Advanced Undergraduate

30:100 Understanding Political Research 3 s.h.
Goal is to create knowledgeable evaluators of current research in political science. Interpretation of different quantitative techniques is considered, using examples from current political science research. Not a statistics course; stresses intuitive, rather than mathematical, understanding.

30:110 The American Political System 4 s.h.
Political behavior of American individuals and groups and institutional structure of political system. Fulfills Iowa teacher certification requirement. Open to juniors and seniors, non-political-science graduate students. No one who has had 30:1 may enroll.

30:111 Municipal Government and Politics 3 s.h.
Models of city government, relations to state and federal governments; rights and liabilities of municipalities; city elections, campaigns and issues; the role of pressure groups.

30:112 Iowa Government and Politics 2-3 s.h.
Iowa's political parties, political campaigns, constitution, election laws, legislative process, judicial procedures, roles of Iowa governors.

30:113 American State Politics 3 s.h.
Approaches to analysis of political behavior in American state governments, with emphasis on cultures, parties, actors, processes, issues.

30:114 Political Parties 3 s.h.
Nature, structure, and functions of political parties in United States; development of motivations, nominationelections, organization, policies in office, and intergroup relations of parties throughout American system.

30:115 The Presidency 3 s.h.
Office, powers, functions of American presidency; recruitment and multiple roles of chief executive; party, congressional, administrative, judicial relationships.

30:116 American Constitutional Law and Politics 3 s.h.
Role of federal Supreme Court in American political system; particular emphasis on analysis of Supreme Court cases.

30:117 The Politics of Civil Rights and Liberties 3 s.h.
Defines the civil rights and liberties of citizens of the United States; materials include legislative statutes, administrative regulations, and judicial decisions.

30:118 Law and Social Change 3 s.h.
How law is used to constrain and promote social change; conditions which make laws effective or ineffective.

30:119 Problems in American Politics 3 s.h.
Selected problems in the study of the American political system, including structures, functions and behavior. For specific current topic, consult *Schedule of Courses*. May be repeated with consent of instructor.

30:120 Introduction to Public Administration 3 s.h.
Administrative and organizational theory and behavior; techniques of management; relations between administration and other branches in federal and state governments; administrative politics.

30:121 Urban Administration 3 s.h.
Problems and principles of urban administration, including tax problems, personnel matters, budgeting, planning and functional operations of city administrations, for example, police, fire, public health, recreation, social welfare services and education.

30:123 Politics of the Budgetary Process 3 s.h.
Survey of budgetary and nonbudgetary aspects of governmental financial operations at national, state and local levels; formulation, enactment and execution of governmental budgets; sources of revenue, cost-benefit analysis, PPBS.

30:126 American Public Policies 3 s.h.
Functions and policies of national government; emphasis on domestic policymaking, impact of public policy.

30:127 Policy Problems in Industrial Societies 3 s.h.
Focuses on public policy problems with which governments in North America and Western Europe have had to deal; emphasis on how these governments have confronted policy problems of advanced industrial societies, and political conflicts within those nations over appropriate policy solutions.

30:129 Problems in Public Administration and Policy 3 s.h.
Selected problems in the study of public administration and policy. For specific current topic, consult *Schedule of Courses*. May be repeated with consent of instructor.

30:131 Foundations of Political Theory 3-4 s.h.
Major writers and intellectual trends in political thought from pre-Socratics to Reformation.

30:132 Modern Political Theory 3-4 s.h.
Major writers and intellectual trends in political thought from Renaissance to 19th century.

30:133 Postmodern Political Theory 3-4 s.h.
Major writers and intellectual trends in political thought from the 19th century to World War Two.

30:134 American Political Theory 3-4 s.h.
Major writers and intellectual trends of political thought in the United States.

30:138 Contemporary Political Theory 1-4 s.h.
Selected thinkers or schools of thought from among the major writers and intellectual trends in political theory from the Second World War to the present. Subjects may change from term to term. May be repeated with consent of instructor.

30:139 Issues in Political Theory 1-4 s.h.
Selected issues in political thought, including democracy, revolution, justice, obligation, technology, authority, and many others. Subjects may change from term to term. May be repeated with consent of instructor.

30:140 Government and Politics of Western Europe 3 s.h.
Political institutions and processes of selected Western European countries, including Great Britain, France, Germany, Scandinavia. For specific country or countries under consideration, consult current *Schedule of Courses*. May be repeated with consent of instructor.

30:141 Introduction to Soviet Government and Politics 3 s.h.
Internal system of government, politics, economics and social order from Revolution of 1917 to present.

30:142 Government and Politics of the Soviet Union and Eastern Europe 3 s.h.
Soviet political system, emphasizing changes in post-Stalin period, with comparisons with East European systems.

30:143 Government and Politics of the Far East 3 s.h.
Functioning and institutions of government in countries of the Far East, with special attention given to social, economic and historical environments which condition them. Same as 39:178.

30:144 Latin American Government 3 s.h.
Governmental institutions and major interest groups in Latin America; general focus upon area as whole.

30:145 Major States of Latin America 3 s.h.
Comparison of political systems of selected major states in Latin America; historical background, with emphasis on contemporary political scene. May be repeated with consent of instructor.

30:146 African Development 3 s.h.
Problems of economic, political, and spatial integration in Africa; patterns and processes of economic development and nation-building. Same as 44:161, 45:162.

30:147 Politics of the Middle East 3 s.h.
Examinations of socio-political forces in the Middle East such as Islam, colonialism, nationalism and socialism; discussion of political processes in major countries of the area; analysis of major interregional and international conflicts. May be repeated with consent of instructor.

30:149 Problems in Comparative Politics 3 s.h.
Selected problems in comparative study of political systems, including comparison of structures, functions, and behaviors of different political systems. For specific current topic, consult current *Schedule of Courses*. May be repeated with consent of instructor.

30:150 Politics of Modernization 3 s.h.
Focuses upon patterns of political change, dealing with major theoretical approaches, including Marxism, evolutionary conceptions, dichotomous models, syncretism; concentration on several critical problems in the analysis of political change: institutionalization, participation, power, linkage, reform, and revolution.

30:151 Political Leadership 3 s.h.
Approaches to the study of leadership, the recruitment of political leaders in different kinds of political systems, and the functions of personality in political leadership, leadership in nongovernmental organizations and at various levels of government.

30:152 The Legislative Process 3 s.h.
Comparative legislative processes and behavior, focusing explicitly upon legislative systems analysis, legislative institutionalization, legislature and its environment, organizational constraints on legislative behavior, recruitment of legislators, web of legislative interactions, legislative voting behavior.

30:153 The Judicial Process 3 s.h.
Role of courts, lawyers, judges, interest groups in American and selected foreign political systems.

30:154 Comparative Constitutional Law and Politics 3 s.h.
Law and politics of constitutional law in several democratic polities, including Canada, Ireland, Japan, West Germany, United States; emphasis on similarities and differences between and among doctrinal outputs of these constitutional courts; intensive reading of cases illuminates the various political roles constitutional courts can and must perform in democratic societies.

30:155 Political Violence and Revolution 3 s.h.
Causes and consequences of violent political behavior, including "institutional violence," political crime, political and social movements, rebellion and revolution, in present-day and past political systems.

30:156 Politics of Ethnic and Cultural Conflict 3 s.h.
Origins, nature, and political consequences of communal cleavage and conflict, including political processes and individual behavior, in selected contemporary societies and international settings; its relation to other types of conflict in government and politics. May be repeated with consent of instructor.

30:157 Voting Behavior and Elections 3 s.h.
Determinants of voting behavior, correlates of political participation and political apathy; political socialization processes and nature and functions of elections.

30:158 Agrarian Politics 3 s.h.
The course treats the following themes: the political attitudes and behavior of farmers and peasants in the United States, Western Europe and the Third World; the role of agricultural interest groups and agri-business in shaping public policy; the transition from rural to urban society in the broader context of the modernization process.

30:159 Governing in the Future 3 s.h.
Examines tools for governing which might be used by governments in the future to cope with the rapidly changing set of political problems they are likely to face. Prerequisite: 30:1 or differential equations.

30:160 International Politics 3 s.h.
Concepts and problems in analysis of international politics; forms and determinants of interaction of states.

30:161 The United Nations 2-3 s.h.
Development, structure, and functions of United Nations; emphasis on decision-making processes of U.N. and impact on international system.

30:162 American Foreign Policies 3 s.h.
Ends pursued, problems encountered, and means employed by United States in relations with other states and with international organizations. Prerequisite: 30:60 or consent of instructor.

30:163 Inter-American Relations 2-3 s.h.
Development and application of Monroe Doctrine, especially with regard to selected Latin American nations; examination of organization and functioning of Organization of American States and current United Sts policy toward Latin America.

30:164 Military Affairs 3 s.h.
Analysis of problems relating to armed conflict, actual and potential, including strategic deterrence, military policy making, the role of the military in contemporary political systems, and present-day conflict.

30:165 Human Rights 3 s.h.
Defines human rights, their moral and legal basis, their promotion and protection through governments and international organizations; comparative and international analysis of equality and nondiscrimination.

30:166 Politics of War and Peace 2-3 s.h.
This course deals with the origins, purposes and effects of war in the modern era; examines various attempts to eliminate or control war as an instrument of policy; and discusses possible alternative methods to secure a peaceful world.

30:167 Arms Races and Arms Control 3 s.h.
Uses and understanding of the determinants of decisions about armaments to evaluate contemporary arms control agreements.

30:169 Problems of International Politics 3 s.h.
Selected problems in analysis of international politics. For specific subject, consult current *Schedule of Courses*. May be repeated with consent of instructor.

30:171 Public Opinion 3 s.h.
Role of public opinion in making public policy; formation and change of political attitudes and opinions; political ideology; measurement of public opinion; understanding opinion polls. Same as 34:153.

30:172 Introduction to International Law 3 s.h.
Principles of law which determine rights and duties of nations in their dealings with each other; contemporary international problems and controversies.

30:180 Honors Introduction to Political Inquiry 3 s.h.
Critical introduction to and examination of the problems and methods of subfields of political science. Lecture/discussion format with regular instructor and guest faculty discussants. Open only to sophomore and junior political science Honors majors; required for Honors in political science. Students not in the political science Honors program may enroll with written consent of the instructor.

30:181 Honors Research Colloquium arr.
Participation under faculty supervision in ongoing research projects, and periodic discussions of work on projects by students involved. Open to political science Honors majors (with consent of faculty supervising work) and others with consent of instructor. Prerequisite: 30:180.

30:182 Honors Seminar arr.
Intensive examination of major ideas and problems of particular area of political science. Open to Honors candidates in political science, and to others with consent of instructor. May be repeated with consent of instructor.

30:183 Honors Seminar arr.
Continuation of 30:182. May be repeated with consent of instructor.

30:184 Honors Senior Research Project arr.
Individually supervised special projects. Registration permitted only with consent of faculty member concerned. Open to senior political science majors only.

30:190 Independent Study arr.
Individually supervised special projects. Prerequisite: consent of instructor.

30:191 Legislative Internship arr.
For undergraduates participating in state/federal internship programs. Prerequisite: consent of faculty.

Introductory Graduate

30:200 Introduction to Political Analysis 4 s.h.
Conceptual problems of political analysis; empirical research strategies and quantitative techniques.

30:210 American Politics 4 s.h.
Review and analysis of major literature of American politics, stressing comparative, systemic, and behavioral studies.

30:220 Administrative Theory and Public Policy 3-4 s.h.
Literature and research on organizational and administrative theory, behavior, politics.

30:222 American Public Policies 3-4 s.h.
Analysis of American public policies, policy-making processes, impacts of public policy; primarily for MAPA students.

30:230 Political Theory 4 s.h.
Introduction to concepts, issues, writers, and works important in the literature of political theory, with emphasis on their relevance for understanding and evaluating contemporary politics.

30:240 Comparative Politics 4 s.h.
Current approaches to comparative analysis of political systems; special attention to conceptual and other methodological issues.

30:260 International Politics 4 s.h.
Emphasizes various approaches to study of international politics.

Advanced Graduate

30:300 Philosophy of Political Inquiry 4 s.h.
Purposes and methods in study of politics.

30:301 Advanced Research Methods 4 s.h.
Fall semester: logical basis of research design; measurement, including data collection, reliability, and validity of data; procedures for preparing data for analysis.

30:302 Advanced Research Methods 4 s.h.
Spring semester: analytical techniques; statistical models, and relationship of models to hypotheses to be tested.

30:304 Quantitative Methods in Public Policy analysis 4 s.h.
Survey of quantitative techniques useful in analyzing public policy, including the construction of indices simulations, surveys, and statistical testing.

30:314 Political Parties 4 s.h.
Systematic investigation of roles, organization, composition, leadership, and functions of parties in the American or other political systems. May be repeated with consent of instructor.

30:315 The Presidency 4 s.h.
Analysis of the American chief executive: history, recruitment, behavior, roles, responsibilities, powers, relationships with other institutions.

30:316 Law and Politics 4 s.h.
Selected issues of constitutional law and politics in several democratic systems; intensive reading and discussion of

and research on doctrinal outputs as well as scholarly commentaries on these outputs.

30:320 Administrative Theory and Behavior **4 s.h.**
Literatures of political theory, political and organizational behavior, and complex organizations as they apply to study of administrative agencies of government.

30:322 Financial Administration **4 s.h.**
Budgetary and nonbudgetary aspects of governmental financial operations at national, state, and local levels; formulation, enactment, and execution of governmental budgets; sources of revenue, debt administration, intergovernmental fiscal relations.

30:323 Comparative Public Policy Analysis **4 s.h.**
Emphasizes study of theories of public policy formation (decision theory, systems theory, theories of political economy), quantitative research methods for studying policy formation, and research applications in North American and Western European nations.

30:324 Seminar: Urbanization **arr.**
Problems and consequences of urbanization process; political, economic, and social study of metropolitan areas. May be repeated with consent of instructor. Same as 34:279, 7D:301.

30:329 Problems in Public Administration and Policy **4 s.h.**
Selected issues in public administration; may be repeated with consent of instructor.

30:339 Problems in Political Theory **4 s.h.**
Selected problems of prescriptive and explanatory political theory; may be repeated with consent of instructor.

30:340 Political Systems of Western Europe **4 s.h.**
Selected Western European political systems or political phenomena common to several such systems.

30:342 Soviet and Eastern European Political Systems **4 s.h.**
Research seminar on selected topics of Soviet and East European politics; permission of instructor required.

30:343 Asian Political Systems **4 s.h.**
Comparative study of democratic, transitional, and totalitarian types of government in Asia; special emphasis on leadership recruitment, social control, political participation.

30:344 Latin American Political Systems **4 s.h.**
Major political forces in Latin America (political parties, church, students, military); intended primarily for graduate students with little or no previous knowledge of Latin American politics.

30:349 Problems in Comparative Politics **4 s.h.**
Selected problems in comparative analysis of politics; may be repeated with consent of instructor.

30:350 Social and Political Change **4 s.h.**
Relationships between political, economic, and social change, including antecedents, accompaniments, and results of major processes of change, development, and decay. May be repeated with consent of instructor.

30:351 Political Elites and Leadership **4 s.h.**
Backgrounds, careers, attitudes and behaviors of political leaders. Geographical focus may vary with instructor. May be repeated with consent of instructor.

30:352 Legislative Behavior **4 s.h.**
Systematic analysis of legislative institutions, processes, and behavior, which may focus on United States, Europe, or developing countries. May be repeated with consent of instructor.

30:353 Comparative Judicial Process **4 s.h.**
Major issues of constitutional law, analysis of judicial processes and behavior.

30:354 Political Socialization **4 s.h.**
Development of political roles, attitudes, orientations; emphasis on theoretical and comparative approaches.

30:357 Public Opinion and Electoral Behavior **4 s.h.**
Analysis of political attitudes and beliefs in mass publics; voting behavior; functioning of electoral systems.

30:358 Bases of Political Behavior **4 s.h.**
Survey of principles of human behavior established in bio-behavioral sciences and their conceptual and methodological implications for political science; application to selected problems in political behavior research.

30:365 Human Rights and World Community **arr.**
Nature of human rights and international obligations relating to them; problems of implementation. Same as 45:361, 19:280, 32:280.

30:369 Problems in International Politics **4 s.h.**
Intensive examination of selected issues of international politics, emphasizing problems of theoretical analysis. May be repeated with consent of instructor.

30:390 Readings and Research Tutorial **arr.**
Independent individual study; consent of supervising faculty member required in writing. May be repeated.

30:391 Internships in Public Policy and Administration **arr.**
Consent of supervising faculty member required.

30:392 Practicum in Public Policy and Administration **arr.**
Consent of supervising faculty member required.

30:395 Master's Thesis **arr.**
Consent of supervising faculty member required.

30:398 Ph.D. Dissertation **arr.**
Consent of supervising faculty member required.

Portuguese

See "Spanish and Portuguese."

Psychology

Department chair: Dee W. Norton
Faculty: *professors* Harold P. Bechtoldt, Arthur L. Benton, Donald D. Dorfman, Stephen S. Fox, Isidore Gormezano, James V. Hinrichs, John A. Harvey, Irwin P. Levin, Walter L. Randall, Milton E. Rosenbaum, Donald K. Routh, Rudolph W. Schulz, J. Richard Simon, Jacob O. Sines, Arthur M. Small, Charles C. Spiker, Dewey B. Stuit
associate professors Robert S. Baron, Thomas D. Borkovec, Joan H. Cantor, Don C. Fowles, Raymond H. Hohle, A. Kim Johnson, John F. Knutson, Dee W. Norton, Sue R. Rosner, Edward A. Wasserman
assistant professors Kevin S. Berbaum, Donal E. Carlston, Stuart A. Greenberg, Richard R. Hurtig, Harriet L. Shaklee, Theodore C. Weerts
Degrees offered: B.A., B.S., M.A., Ph.D.

Undergraduate Programs

The B.A. and B.S. degree programs both are designed to contribute to a student's general liberal education and to provide a foundation for postbaccalaureate training in any of a wide variety of areas of specialization. Students interested in psychology should clearly understand that almost all vocational opportunities in psychology require substantial advanced preparation.

The B.S. program is specifically intended for students planning to pursue advanced work in psychology or in a closely related discipline; the B.A. program has somewhat fewer specific requirements and puts less emphasis on experimental methods. Both programs leave ample time for the student to combine work in psychology with work in another discipline or program.

Students in either program begin with a general introductory course, followed by one or more courses in methodology and electives in several broad areas of psychology; clinical, developmental, social, physiological and general experimental. The Department maintains excellent facilities to support teaching and research about human and animal behavior. All faculty members are actively engaged in research and they bring to their undergraduate teaching the excitement that such activity engenders. Many opportunities exist for interested and capable students to participate in some of the research projects being carried on in the Department.

The Bachelor of Arts Degree

The student must satisfy the general College of Liberal Arts requirements for the B.A. degree and must complete at least 25 semester hours in psychology. At least 15 semester hours of the major t be completed in this Department.

The B.A. program must include 31:1 Elementary Psychology, or 31:3 General Psychology, equivalent; 31:43 Evaluating Psychological Research, or equivalent; and one area elective course or equivalent from each of four of the five area groupings given below.

The 31:43 requirement may be satisfied by a combination of 31:143 Introduction to Statistical Methods and 31:120 Experimental Psychology I. This alternative is strongly recommended to students in the B.A. program who plan to pursue graduate work in psychology or a related area.

The Bachelor of Science Degree

The student must satisfy the general College of Liberal Arts requirements for the B.S. degree and must complete at least 26 semester hours of course credit in psychology. At least 15 semester hours of the major must be completed in this Department.

The B.S. program must include the following courses, or equivalents: 31:1 Elementary Psychology or 31:3 General Psychology; 31:143 Introduction to Statistical Methods; 31:120 Experimental Psychology I; 31:121 Experimental Psychology II; and one elective course from each of four of the five area groupings given below, with at least three of these four area electives being 100-level courses.

Candidates for the B.S. degree in psychology must satisfy the College of Liberal Arts natural science core requirement with one semester of chemistry followed by one semester of zoology; or with eight semester hours of chemistry; or with eight semester hours of physics.

B.S. majors also must complete either one semester of calculus and two semesters of one foreign language, or two semesters of mathematics through analytic geometry and four semesters of one foreign language.

The courses in natural science and mathematics required for the B.S. degree cannot be taken pass-fail.

Area Electives

Area A (Biopsychology and Physiological Psychology)

31:50 Comparative Psychology and Ethology
31:123 Psychology of Learning
31:125 Brain Function and Learning
31:126 Physiological Psychology and Psychobiology
31:128 Introduction to Behavioral Pharmacology
31:129 Biological Aspects of Behavior
31:135 Operant Behavior Analysis

Area B (Clinical Psychology)

31:13 Psychology of Adjustment
31:105 Personality
31:161 Current Theories of Schizophrenia
31:163 Abnormal Psychology
31:166 Abnormal Child Psychology
31:170 Behavior Modification

Area C (Developmental Psychology)

31:14 Introduction to Child Psychology
31:112 Development of Social Judgment
31:114 Cognitive Development of Children
31:116 Psychology of Sex Differences
31:148 Individual Differences in Developmental Psychology
31:153 Psychology of Language II

*Only one of these courses can be used to satisfy all area requirements.

Area D (General Experimental Psychology)

31:16 Introduction to Mental Processes
31:102 Psychology as a Science
31:110 Learning and Motivation in Children
31:113 Psychology of Language I
31:119 Human Memory, Learning and Conceptual Processes
31:133 Perception

Area E (Social Psychology)

31:15 Introduction to Social Psychology
31:103 Development of Children's Social Behavior
31:106 Attitude Change
31:108 Small Group Processes

The Honors Program

The Department has an active Honors program open to majors with at least a 3.3 grade-point average in psychology courses and 3.0 overall. The program includes research seminars and individual research collaboration with faculty members. Students ordinarily are selected to participate in the Department's 31:95 Honors Seminar in Psychology during the spring semester of the junior year. Interested majors should contact the Department Honors adviser early in the junior year.

Graduate Program

The graduate program in Psychology is designed to provide comprehensive training leading to the Ph.D. degree with emphasis in one of the following broad training areas: animal learning and biopsychology, child and developmental psychology, clinical psychology, general experimental psychology, social psychology. The program is planned to provide both general training and specialty training with sufficient flexibility to encompass a wide spectrum of student interests.

The primary purpose of the program is to produce graduates who are deeply committed to the study of behavior, familiar with fundamental knowledge about behavioral processes, thoroughly trained in the methods and techniques for careful investigation of basic and applied problems, and determined to make significant contributions to the discipline of psychology and to society generally.

The most appropriate jobs for graduates of this program are in academic, governmental, business, or private institutions which provide opportunities for continuing analysis and investigation of fundamental questions about behavior, for teaching about research results and methodologies, and for application of psychological knowledge and techniques to the solution of important practical concerns. Prospective applicants should understand that the number of such positions is sharply limited and the competition for available openings is intense.

Program Requirements

The graduate program in Psychology is designed as a four-year program leading to the Ph.D. degree; students in the clinical area ordinarily have an additional off-campus internship year. A student entering with a master's degree from another institution will require at least two additional years in this Department depending on the nature and extent of previous research activity.

The M.A. with Thesis

The Master of Arts degree with thesis is required for all students who intend to earn the Ph.D. in this department, and may be the primary degree objective for a very few students, particularly those in special joint programs. This degree is granted after satisfactory completion of at least 30 semester hours of graduate credit, including requirements specified by the Department; preparation of an acceptable scholarly thesis; and successful oral defense of the thesis. Typically work for this degree should be completed after four semesters in the Department.

The M.A. without Thesis

The Master of Arts degree without thesis also is available and may be the appropriate objective for certain special students. It ordinarily will be the degree taken by those

students who for various reasons decide to terminate their work in this Department after Department after four semesters. The M.A. without thesis requires satisfactory completion of at least 38 semester hours of graduate credit, including courses required by the Department, and successful performance on a written and/or oral examination covering the student's area of specialization.

During the first three semesters each beginning graduate student follows a curriculum involving both required and elective courses designed to develop understanding of the content, theory, research methods and investigative techniques appropriate to the specialty area. All students also engage in supervised research practicum during each of these semesters. By the end of the third semester each beginning student is expected to have demonstrated competence in coursework and in research practicum, and to have participated effectively in the teaching, research and service functions of the Department. In addition each student intending to proceed toward the Ph.D. is expected to have made substantial progress in planning for the master's research project. A faculty-wide review of each student's progress is conducted at this point in the student's program.

The Ph.D.

The Ph.D. degree in this Department requires satisfactory completion of at least 72 semester hours of graduate credit, including at least 33 in the Department. The student must satisfy requirements in statistics and in learning, and is expected to take sufficient work outside the specialty area to develop a reasonably broad background in the discipline of psychology as a whole. The student is also encouraged to become familiar with the history and philosophy of psychology. The nature of these requirements and their placement within the graduate program varies somewhat among the training areas, and depends also on the individual student's background and interests.

Formal advancement of a student to Ph.D. candidacy follows a review conducted after the fifth semester. By this time the student must have completed and defended the master's thesis, demonstrated an ability to approach psychological problems in an independent and creative manner, and passed a comprehensive examination.

During the latter part of the third year and the first part of the fourth year, and while continuing selected coursework and advanced seminars, the student develops a prospectus for the dissertation research. Following approval of the prospectus, work toward the Ph.D. proceeds with the conduct of the doctoral study, preparation of the dissertation and, finally, the Ph.D. final examination, which is an oral defense of the dissertation.

More specific information about training area programs, degree requirements, policies and procedures for evaluation of student progress and performance, and other matters of concern to graduate students is set forth in the Department's *Graduate Student Handbook*, which is provided to each student at the time of initial registration.

Major Specialty Areas for Graduate Training

The focus of the program in *animal learning and biopsychology* is on the analysis of learning and motivation, primarily in nonhuman subjects, through the application of behavioral and biological principles. Students in this program will have the opportunity to learn the most modern analytical and laboratory methods in computer-assisted experimentation, electronic instrumentation, neurosurgical and histological techniques, and biochemical assay procedures. Special faculty strengths are in the fields of classical and operant conditioning, comparative psychology, motivation, neuropharmacology, neuroendocrinology, and neuroanatomy.

The *child and developmental psychology* program provides opportunities for students to acquire a general understanding of the child-developmental field, as well as a focused understanding of developmental trends within a specific field. Specialized fields include: sensory and perceptual processes, verbal processes and memory, learning and thinking, social processes, and psychopathology.

The *clinical* program strongly emphasizes an empirical approach to the study of psychopathology. It is designed for students who are primarily interested in developing scholarly understanding of clinical phenomena and acquiring research skills necessary to the systematic investigation of such phenomena. Recognizing that students must become familiar with clinical material and competent in clinical skills, practicum experience in the Department's Research and Training Clinic is closely integrated with coursework in the content, theory and research methods of psychology and with supervised research experience. Students may develop special competence in such areas as psychophysiology, aggression, psychotherapy, behavior therapy, schizophrenia, psychodiagnosis, clinical neuropsychology, and clinical-developmental psychology. A special training program supervised jointly by faculty members from the clinical area and from the child and developmental area is available for students with interests in clinical aspects of childhood and development. Advanced students have opportunities for additional clinical experience in placements with local agencies such as the Veterans Administration Hospital, the Iowa Psychiatric Hospital, the Hospital School for Handicapped Children and the Oakdale Rehabilitation Unit. Students ordinarily also complete a one-year internship at an accredited clinical facility either before or after completion of the four-year academic program. The clinical training program is fully approved by the American Psychological Association.

The *general experimental* program focuses primarily on the study of human behavior. Three major subareas are represented: cognitive processes, sensation and perception, and experimental child psychology. Students specializing in cognitive processes acquire expertise in areas such as information processing and decision making, learning and memory, and concept formation and language behavior. Students with interests in sensation and perception may concentrate on visual perception, auditory processes or mathematical models in perception and psychophysics. Students in experimental child psychology specialize in areas such as discrimination learning, problem solving and transfer of training. All students in the general experimental program develop sophistication about laboratory techniques, computer-controlled data acquisition and reduction systems, and electronic instrumentation. In addition, they acquire a solid background in statistical techniques and in the historical and contemporary theoretical frameworks of psychology.

The *social psychology* program offers specialized training in three subareas: social influences on behavior, attitude formation and change, and the psychology of groups. The first of these includes such phenomena as social learning, imitation, conformity, social facilitation, behavioral contagion and social reinforcement. The second includes

attitude acquisition, cognitive consistency and the notions of commitment, persuasion and attribution. Under the third subarea, one might focus on group versus individual performance, on interdependence or on topics in the area of social interaction. In addition to thorough training in the basic disciplines of experimental psychology, statistical analysis, computer processing, etc., the student in the social area has ample opportunities to handle instrumented observation laboratories and to develop skill in the conduct of field investigations.

Special Facilities

The Department's facilities for graduate training and research are among the finest in the country. The Kenneth W. Spence Laboratories of Psychology, and adjoining space in East Hall, include three separate animal facilities, several surgeries, a histology laboratory, a number of small laboratory computers, automated data acquisition and reduction systems, observation suites with remote audio-visual control and recording equipment, soundproof chambers, closed-circuit TV systems, electrophysiological recording rooms, conditioning laboratories, the Research and Training Clinic and well-equipped electronic, mechanical and woodworking shops. Specially-equipped research trailers are available for use in studies conducted at schools and other locations.

Students and faculty have ready access to the IBM 360/65 in the University Computer Center through an ATS terminal and a remote input-output station in East Hall. Office space for graduate students and faculty is provided in East Hall and the Psychology-Education branch of the main University Library is conveniently located in the west wing of East Hall.

The research and teaching activities of the Department are greatly benefited by the facilities and staff of other University and local agencies including the University Early Childhood Education Center, the University's General, Children's and Psychiatric hospitals, the Veteran's Administration Hospital, the University Counseling Center, the Child Development Clinic, the Speech and Hearing Clinic, and the Institute of Urban and Regional Research.

Financial Assistance for Graduate Students

All students admitted to the graduate training program in Psychology automatically are considered on the basis of merit for such financial support as may be available in the form of teaching assistantships, research assistantships, traineeships, tuition scholarships, etc. No separate application for financial aid is required.

Graduate Admission

As is evident from the preceding paragraphs, the graduate program in psychology is geared primarily to students seeking the Ph.D. degree; all applicants are considered on this basis. A very small number of qualified applicants interested in advanced work only through the M.A. level may be admitted, primarily those who intend to pursue a joint graduate program involving psychology and another discipline or profession. Joint programs must be specially designed and the individual must apply to and be accepted by each program.

Applications may be submitted at any time but are considered only once each year—between February 15 and March 15—for admission the following fall. Admission decisions are based on a composite consideration of prior academic performance, letters of reference, scores on the verbal and quantitative sections of the Graduate Record Examination and the applicant's statement of reasons for pursuing advanced work in psychology. Initial review of admission materials is done by faculty members in the specialty area in which the applicant expresses primary interest. An undergraduate major in psychology, including a laboratory course in experimental psychology, a course in statistics and additional work in the natural sciences and in mathematics, is certainly desirable though not required. Students who have not had such a background but who are strongly qualified on other grounds may be admitted but will be expected to remedy deficiencies through special coursework or independent study prior to embarking on the regular graduate program.

A student who has completed substantial graduate work at another institution at the time of admission to this program will be expected to present documents such as the master's thesis or equivalent which reflect significant engagement in research and scholarly writing. This material and the record of previous graduate coursework will be reviewed by the faculty members of the appropriate training area as a basis for placement in the graduate program. In no instance will a student be permitted to complete substantial research or writing for a master's degree at another institution while a regular full-time student in the graduate program at Iowa.

A foreign language is not required for admission, and there are no foreign language requirements for either the M.A. or the Ph.D. degree in psychology.

Special Faculty Strengths

National rankings of graduate psychology programs consistently have shown this Department to be among the top 20 in the nation. The widely recognized commitment of the faculty to research and scholarship is manifest in the publication of some 75 articles, books, reviews and book chapters each year, and in the fact that many of the faculty members are, or have been, active as editors, associate editors and regular consulting editors for major psychological journals.

Courses

For Undergraduates

Either 31:1 or 31:3 is prerequisite to all other courses in psychology except 31:17 and 31:143.

Subject to this general prerequisite and to specific prerequisites for particular courses, all psychology courses are open to freshmen. Either 31:1 or 31:3, but not both, may be taken toward the College of Liberal Arts social science core requirement, and only one may be applied toward the major in psychology.

31:1 Elementary Psychology **3-4 s.h.**
Summary of psychology as a behavioral science; students are required to become familiar with methods of investigation in psychology through participation in research studies or review of research literature. May not be taken Pass-Fail.

31:3 General Psychology **4 s.h.**
Same as 31:1, but with additional discussion sessions and greater emphasis on manner in which experimental method is applied to analysis of behavior. Recommended for students taking B.S. major in psychology; also open to all Honors students, and to other qualified students with permission of instructor. May be taken Pass-Fail.

31:13 Psychology of Adjustment **3 s.h.**
Lectures focus on selected issues and difficulties in normal human adjustment.

31:14 Introduction to Child Psychology **3 s.h.**
Survey of recent research and theory on biological, cognitive and social aspects of development from infancy through adolescence.

31:15 Introduction to Social Psychology **3 s.h.**
Research relating behavior of individual human organisms to factors in social environment; socialization and acculturation, attitude development and change, social influences on perceptual and conceptual processes, social interactions; contributions by sociologists and anthropologists.

31:16 Introduction to Mental Processes 3 s.h.
Survey of the study of individual human cognition; perception, attention, memory, language learning, problem solving, decision making and thought, considered from information processing viewpoint; implications of the study of human rationality for social interactions and attitudes, reactions to stress and emotion.

31:17 Educational Psychology and Measurement 3 s.h.
Same as 7P:75.

31:19 Psychology in Business and Industry 3 s.h.
Applications of psychology to problems in the world of work; emphasis on personnel selection, training, attitudes, motivation, measuring job performance.

31:43 Evaluating Psychological Research 2, 4 s.h.
Concepts and procedures basic to definition and utilization of selected behavioral variables considered in context of experimental and applied problems. Students who have had 31:143 or equivalent can register for only 2 s.h.

31:50 Comparative Psychology and Ethology 3 s.h.
Survey of empirical and theoretical work in the study of animal behavior and the relationship of studies of animals to man; concern with the causes and functions of behavior; topics include: instinct, learning, sociobiology, communication, motivation and evolution.

31:65 Language and Psychology 3 s.h.
Introduction to language: structure, function, process, and acquisition; includes linguistic analysis, communication, meaning, speech perception, language development, language disorders, and sociolinguistics. Prerequisite: 31:1.

31:85 Research Practicum in Psychology arr.
Small group participation in faculty research projects; includes literature review, planning of studies, data collection, analysis, interpretation and write-up. May be repeated. Prerequisites: sophomore standing and consent of instructor. Pass-Fail grading.

31:91 Special Readings and Projects arr.
For undergraduate majors in psychology. Prerequisites: sponsorship of staff member and approval of Department chair. Pass-Fail grading.

31:95 Honors Seminar in Psychology 3 s.h.
Lectures, readings and discussions in a variety of research areas in psychology, leading to choice of topic for Honors project. Pass-Fail grading.

31:99 Honors Thesis Research 3 s.h.
Supervised original research project, leading to written thesis and oral defense. Open only to Honors students.

For Undergraduates and Graduates

31:101 Social Psychology 3 s.h.
Current research activities in social psychology; primary emphasis on laboratory study of social behavior; critical evaluation of contemporary theories and methodologies.

31:102 Psychology as a Science 3 s.h.
Analysis of the nature of the concepts, laws and theories of modern psychology, with discussions of the logic of measurement and probability; exercises in analyzing psychological research. Prerequisite: junior or senior standing or permission of instructor.

31:103 Development of Children's Social Behavior 3 s.h.
Basic processes affecting children's responses to the social environment; attachment and dependency, social reinforcement, imitation and moral development.

31:104 Experimental Social Psychology 3 s.h.
Experimental approaches to attitude modification, social perception, judgment and related social processes; theory and critical evaluation of methodology in representative types of problems.

31:105 Personality 3 s.h.
Determinants, correlates, consequences of adjustive functions and personality development.

31:106 Attitude Change 3 s.h.
Current theoretical approaches to attitude change; laboratory and field methods of research; consideration of basic processes of change within broader framework of psychology.

31:108 Small Group Processes 3 s.h.
Classic work on group processes stressing laboratory experiments, field studies and observations, relevant theory; topics may include conformity, reference groups, cohesion, contagion, group performance, responsibility, diffusion, decision making, conflict. 31:15 recommended but not required.

31:109 Psychology of Aggression 3 s.h.
An examination of major theories and research on aggressive behavior in human and nonhuman subjects.

31:110 Learning and Motivation in Children 3 s.h.
Survey of research and theory on children's conditioning, discrimination learning, verbal learning and memory, transfer of training and motivational systems.

31:111 Child Development 3 s.h.
Not open to sophomores. Same as 7P:106.

31:112 Development of Social Judgment 3 s.h.
Influence of basic processes of cognitive development on children's competence in explaining and evaluating the social environment; relationships between social judgment and social behavior.

31:113 Psychology of Language I 3 s.h.
Review of theoretical and empirical studies of linguistic behavior; speech perception/production, linguistic universals and nativism, animal communication, neurological correlates of speech, artificial intelligence/computer-simulated speech, relation of language and thought. Same as 3:117, 103:172.

31:114 Cognitive Development of Children 3 s.h.
Developmental research and theory concerning conceptual, perceptual and verbal processes of children.

31:115 Educational Psychology 3-4 s.h.
Same as 7P:131.

31:116 Psychology of Sex Differences 3 s.h.
Topics on the nature of sex differences in behavior, possible sources of those differences, and the importance of sex differences in the lives of males and females; relies on experimental literature in psychology.

31:117 Exceptional Children 3 s.h.
Same as 7U:130.

31:119 Human Memory, Learning and Conceptual Processes 3 s.h.
An introduction to contemporary psychological theory and research.

31:120 Experimental Psychology I 3 s.h.
Logic and application of experimental methods to analysis of behavioral phenomena; includes overview of some major problem areas of experimental psychology. Prerequisites: 31:143 or equivalent.

31:121 Experimental Psychology II 2-4 s.h.
Laboratory study of problem area in experimental psychology; various sections deal with different problem areas, such as learning and memory, perception, social behavior, sensory and physiological processes, infrahuman behavior. May be repeated for credit when topics vary. Prerequisite: 31:120 or equivalent.

31:123 Psychology of Learning 3 s.h.
Theoretical and experimental bases of learning in animal and human behavior. Prerequisite: 31:43 or 31:143 or consent of instructor.

31:124 Introduction to Mathematical Models in Psychology 3 s.h.
Introduction to mathematical models in the interpretation of behavioral data; application to learning, decision making, information processing and social processes. Prerequisite: one course in statistics or experimental design.

31:125 Brain Function and Learning 3 s.h.
Survey of physiological psychology, with emphasis on sensory and motor systems and integrative processes of nervous system.

31:126 Physiological Psychology and Psychobiology 3 s.h.
Introduction to basic concepts and techniques in the neurosciences and their application to the analysis of sensory processes, arousal mechanisms, motivation and learning.

31:127 Drugs and Behavior 3 s.h.
Review of methodological and theoretical problems involved in psychopharmacological research; consideration of social, psychological, sociological, anthropological and legal factors.

31:128 Introduction to Behavioral Pharmacology 3 s.h.
An analysis, derived from experimental study of animals, including man, of behavioral consequences of drugs.

31:129 Biological Aspects of Behavior 3 s.h.
Introduction to biological bases of behavior; consideration of alternative perspectives in physiological psychology.

31:130 Psychology of Thinking 3 s.h.
Problem solving, reasoning, judgment and decision making, language and thought, intelligence and creativity. Recommended: 31:16.

31:131 Art and Perception 3 s.h.
Examination of commonalities of concepts in discussions of art and of perceptual processes from the viewpoint of experimental aesthetics.

31:132 Motivation 3 s.h.
Recent contributions to motivational research with critical examination of methodologies and implications of contemporary theory.

31:133 Perception 3 s.h.
Recent developments in experimental and theoretical approaches to perception, with an emphasis on physiological and behavioral results derived from studies of visual functions.

31:135 Operant Behavior Analysis 3 s.h.
Introduction to methodology, concepts and results of operant approaches to experimental analysis of behavior in laboratory and applied settings. Prerequisite: 31:43 or 31:143.

31:138 Love, Power and Justice 3 s.h.

31:139 Assessment of Emotion 2 s.h.

31:140 Lab Techniques in Assessment of Emotion 1 s.h.

31:143 Introduction to Statistical Methods 3 s.h.
Same as 7P:143, 22S:102.

31:148 Individual Differences in Developmental Psychology 3 s.h.
Examination of the development of individual differences in the areas of abilities, cognitive styles, temperament, motivation.

31:153 Psychology of Language II 3 s.h.
Alternative models of language acquisition; topics include: grammatical description of children's natural speech, experiments on grammatical development, semantic

development, theoretical models of language learning, pragmatics and attainment of communicative competence; speech perception and production in infancy. Prerequisite: 31:113, 103:100 or consent of instructor. Same as 103:176, 3:116.

31:155 Human Engineering **3 s.h.**
Design of man-machine systems and development of optimum work environment by applying principles of behavioral science; emphasis on sensory and perceptual processes, motor skills, experimental methodology. Same as 586:155.

31:156 Psychology in Management **3 s.h.**
Application of psychological principles to human relations and supervision; discussion of motivation, leadership, communication, group pressures, other topics. Same as 586:156.

31:161 Current Theories of Schizophrenia **3 s.h.**
In-depth examination of nature of schizophrenia; concerned with theories and research in area, including selected topics such as clinical features, premorbid adjustment, genetic vs. environmental influences, cognitive deficits, and pharmacological and psychological treatment.

31:162 Sleep and Sleep Disorders **3 s.h.**
Review of current knowledge of the nature and functions of the various stages of sleep; study of the numerous disorders of sleep, with emphasis on medical and psychological approaches to their treatment.

31:163 Abnormal Psychology **3-4 s.h.**
Review of the major adult psychiatric disorders (e.g., neurosis, psychopathy, schizophrenia, depression) with special emphasis on the application of basic concepts to theories of etiology.

31:164 Introduction to Clinical Psychology **3 s.h.**
Introduction to field of clinical psychology with consideration of basic issues and selected research topics. Prerequisite: 31:163 or consent of instructor.

31:165 Stuttering **3 s.h.**
Prerequisite: 31:167 or consent of instructor. Same as 3:163.

31:166 Abnormal Child Psychology **3 s.h.**
Survey of major types of psychopathology in childhood.

31:167 Introduction to Speech and Hearing Processes and Disorders **3 s.h.**
Same as 3:176.

31:170 Behavior Modification **3 s.h.**
Basic approaches to the modification of clinically distressing behavior; focus on the learning theory principles underlying the techniques, translation into procedures, and experimental evaluation of effectiveness.

31:180 Current Topics in Psychology **2 s.h.**
Critical appraisal of the literature pertaining to a specific topic of current interest; various sections deal with different problem areas. May be repeated for credit when topics vary.

For Graduates

31:202 Attitude Development and Change **3 s.h.**
Review of research involving attitude measurement; experimental analysis of variables influencing formation and modification of attitudes.

31:203 Social Perception and Attribution **3 s.h.**
Theory and empirical analysis of perception of persons and attributions concerning internal processes. Consideration of determinants of impression formation, attraction, and behavioral prediction.

31:204 Group Dynamics **3 s.h.**
Theoretical and empirical analysis of social power, social norms, social roles, interpersonal exchange bargaining.

31:205 Social Influences on Behavior **3 s.h.**
Methodology, results and interpretations of studies of influence of social variables on learning, judgment, attitude development and modification, group processes, aggression.

31:206 Social Learning Processes **3 s.h.**
Theory and research on learning in social contexts; topics considered include observational learning, development of social reinforcers, dependency, aggression and affiliation.

31:210 Advanced General Psychology **3 s.h.**
Same as 31:3, but includes additional assignments for graduate students who have not had an elementary course in psychology.

31:211 Processes in Social Development **3 s.h.**
Critical analyses of experimental and field studies dealing with the social development of the child.

31:212 Perceptual Development **3 s.h.**
Review of research procedures and results bearing on development of sensory and perceptual processes in children.

31:214 Learning in Children **3 s.h.**
Review and analysis of research with children on conditioning, generalization, discrimination learning, verbal learning and memory, and transfer of training. Open to upper-level undergraduates with permission of instructor.

31:215 Philosophy of Modern Psychology **3 s.h.**
Analysis and discussion of scientific method in its application to modern psychology; laboratory exercise in analyzing psychological research.

31:216 Verbal Processes in Children **3 s.h.**
Age trends in verbal learning and memory processing.

31:217 Advanced Developmental Psychology **3 s.h.**
Analyses of developmental theory, methodology and representative fields of investigation.

31:218 Thinking and Problem Solving in Children **3 s.h.**
Reasoning and logical thinking, concept learning, problem solving; effects of perception, memory, and language in children's thinking.

31:219 Experimental Psycholinguistics **3 s.h.**
Detailed examination of the theoretical and empirical issues in psycholinguistics, specific models introduced to deal with the relation of the formal structure of language, as characterized by the rules of the grammar, and the psychological operations utilized in speech perception and production; laboratory sessions provide familiarity with paradigmatic research in psycholinguistics. Prerequisite: 31:117 or consent of instructor. Same as 3:218, 103:218.

31:220 Discrimination Learning in Children **3 s.h.**
Theory and research on acquisition of differential responding in classical and instrumental conditioning and in simultaneous, successive, relational and oddity discriminations.

31:221 Motivation and Emotion **3 s.h.**
Concepts of motivation and emotion, critical review of research on their functions as determinants of behavior.

31:222 Conditioning and Learning **3 s.h.**
Methodology, results, interpretation of conditioning and simple learning experiments with humans and animals.

31:223 Information Processing in Psychology **3 s.h.**
Examination of information processing approaches to theoretical analysis of complex behavior; theoretical concepts including information theory, mechanical models and computer simulation reviewed and applied to selected empirical topics.

31:224 Sensory Processes **3 s.h.**
Methods, concepts and results of research relating to processes by which information is obtained by an organism about its environment. Advanced undergraduates may be admitted with permission of instructor.

31:225 Learning, Memory and Cognition **3 s.h.**
Survey of the historical development and current theories of human symbolic behavior, with emphasis on acquisition retention, and use of verbal associations; other major topics include visual imagery, simple decision making, concept formation, problem solving, choice behavior. Same as 103:272.

31:226 Perception and Psychophysics **3 s.h.**
Review of current literature on perception, psychophysics, and scaling, and of recent trends in visual perception.

31:227 Introduction to Physiological Psychology **3 s.h.**
Basic facts and concepts in biopsychology, with special emphasis on the relationship and relevance to behavior of the concepts and facts of evolution, neuroendocrinology, homeostasis, biological rhythms and neuroanatomy.

31:228 Neuroendocrinology and Behavior **3 s.h.**
Development of behavioral concepts related to neuroanatomic and neuroendocrine aspects of thirst, hunger and sex. Prerequisite: 31:227.

31:229 Neural Mechanisms and Learning **3 s.h.**
Information processing in the brain, electrobiology, sensory and motor coding, integrative functions, sleep, waking and attention, as related to behavior. Prerequisite: 31:227 or consent of instructor.

31:230 Behavioral Pharmacology **3 s.h.**
Behavioral analysis of drug action in experimental animals, including man; special emphasis on physiological and biochemical mechanisms underlying various behavioral processes in experimental animals and in human psychopathology.

31:231 Advanced Neuropharmacology **3 s.h.**
Lectures on biochemistry and structure of the vertebrate nervous system as related to the actions of drugs; behavioral and physiologic correlates of specific drug actions; special topics of central nervous system research of current interest. Prerequisite: consent of instructor. Same as 71:213.

31:233 Regulatory Behavior **3 s.h.**
In-depth discussion of homeostatic behaviors (i.e., drinking, feeding, and behavioral temperature regulation); emphasis on the biological substrates of these behaviors, their relationship to parallel physiological control systems, and the expression of disordered regulation through these behaviors in cases of pathology.

31:234 Philosophical Problems of the Social Sciences **3 s.h.**
Same as 26:203.

31:236 Laboratory Techniques **2-3 s.h.**
Introduction to digital logic and real-time computing applications in experimental psychology. Prerequisites: elementary background in electronics and computer programming and consent of instructor.

31:237 Experimental Analysis of Behavior **3 s.h.**
Technology, findings and interpretation of operant behavioral analysis of learning, perception, motivation and conceptual processes.

31:238 Psychophysiological Research Methods **3 s.h.**
Primarily laboratory course designed to acquaint students with principles and methods involved in the use of polygraph to record psychophysiological measures. Background in electronics not required.

31:239 Human Psychophysiology **3 s.h.**
Review of basic concepts and issues in field of psychophysiology; emphasis on application to research on psychopathology. Previous courses in physiology or physiological psychology not required.

31:240 Human Judgment: Models and Applications 3 s.h.
Analysis of models and methods used in the study of human judgments and decisions; description of applications in such areas as clinical diagnosis, social and educational evaluations, consumer and urban decisions.

31:241 Developments in Pattern Recognition 3 s.h.
Survey of recent experimental investigations of human pattern recognition; experiments relating to contemporary theoretical positions (construction, direct and indirect realism) will be stressed.

31:243 Statistical Analysis I 4 s.h.
Review of statistical concepts and techniques used in designed investigations and experiments, planning and analysis of single and multifactor experiments involving completely randomized, related measurements, and mixed designs. Prerequisite: 31:143 or equivalent and consent of instructor.

31:244 Correlation Methods 3 s.h.
Prerequisites: 31:143 and 7P:243, or equivalents. Same as 7P:244, 22S:157.

31:245 Quantitative Methods in Psychology 3 s.h.
Mathematical methods necessary for understanding and use of mathematical models in psychology; applications considered; short review of calculus.

31:246 Statistical Analysis II 4 s.h.
Continuation of 31:243 to include planning and analysis of more complex investigations and experiments, simple and multiple correlation, trend analysis, multiple regression analysis, and covariance. Prerequisites: 31:243 or equivalent, and consent of instructor.

31:253 Language Acquisition 3 s.h.
Linguistic theories and early language development; children's semantic development; children's language acquisition in the context of general theories of acquisition and learning; acquisition of the use of language as a communicative skill. Same as 3:218, 103:222.

31:260 Psychopathology I 3 s.h.
Detailed consideration of psychiatric syndromes, including description, etiology, experimental and clinical research; includes consideration of development and function of classification systems.

31:261 Psychopathology II 3 s.h.
Extension of material covered in 31:260 with more intensive consideration of recent research on selected topics such as schizophrenia, depression, psychopathy.

31:263 Psychological Appraisal I 3 s.h.
Examination of background, development, administration and scoring of selected psychological techniques used in the clinical assessment of children and adults. Prerequisite: permission of instructor.

31:264 Psychological Appraisal II 3 s.h.
Detailed consideration of the clinical use and interpretation of selected psychological assessment techniques; emphasis on research evidence of their validity and utility. Prerequisites: 31:263 or equivalent and permission of instructor.

31:265 Clinical Neuropsychology 3 s.h.
Conceptions of brain-behavior relationships in man; analysis of behavioral disturbances associated with cerebral abnormality; current application of psychological test methods for inferring cerebral status.

31:268 Clinical Child Psychology 3 s.h.
Various assessment techniques and diagnostic schemes in relation to behavioral, psychoanalytic, nondirective and pharmacological therapeutic approaches to various childhood disorders.

31:269 Theory and Techniques of Psychotherapy 3 s.h.
Survey course in major psychological techniques of behavior change; critical evaluation of theories and techniques. Prerequisite: consent of instructor.

31:270 Outcome Research in Psychotherapy 3 s.h.
Experimental design and methodology in the evaluation of therapy efficacy and underlying theory, consideration of issues of measurement, placebo effects, client and therapist characteristics, and spontaneous remission.

31:271 Psychoacoustics 3 s.h.
Same as 3:254.

31:272 Psychoacoustics Laboratory 2 s.h.
Same as 3:255.

31:273 The Aphasic Disorders 2 s.h.

31:275 Behavioral Therapy 3 s.h.
Learning or conditioning approaches to treatment of psychopathology, including techniques of Pavlovian conditioning, operant conditioning, systematic desensitization, implosive therapy, social learning approaches.

31:276 Psychopathology in Childhood 3 s.h.
Factors such as sex, age, social class, race, family interaction and heredity will be considered in the etiology of aggression, withdrawal, depression, sociopathy, delinquency, mental retardation, hyperkinesis, childhood psychoses and psychosomatic complaints.

31:277 Marital and Family Therapy 3 s.h.
Theoretical foundations, clinical procedures, and research investigations relative to treatment of families and couples; emphasis on behavioral and systems approaches to intervention. Includes live and videotaped demonstrations of intervention strategies, along with practice in clinical interviewing with couples.

31:284 Advanced Techniques in the Neurosciences 1 s.h.
Same as 99:284, 71:284, 37:284, 60:284, 72:284.

31:291 Problems in Psychology arr.
Readings and papers under individual guidance of staff member. Consult instructor before registering.

31:295 M.A. Thesis Research arr.
Consult instructor before registering.

31:296 Ph.D. Dissertation Research arr.

31:297 Research Projects arr.
Consult instructor before registering.

31:301 Seminar: Personality 2 s.h.
Systematic review of selected topics. May be repeated. Prerequisite: consent of instructor.

31:302 Seminar: Social Psychology 2 s.h.
Review of selected topics. May be repeated. Prerequisite: consent of instructor.

31:305 Seminar: Research Methods and Current Literature in Social Psychology 2 s.h.
Oriented to major theoretical and empirical issues in social psychology; in addition, students are encouraged to discuss their own research in seminar format. Enrollment limited to graduate students in social psychology, unless permission obtained in advance from instructor.

31:306 Seminar: Clinical Child Psychology 2 s.h.
Intensive treatment of current issues in child psychopathology.

31:311 Seminar: Developmental Processes 2 s.h.
Systematic review of selected topics.

31:312 Seminar: Development of Verbal Processes 2 s.h.
Selected topics pertaining to children's verbal behavior. Prerequisite: consent of instructor.

31:314 Seminar: Language Development 2 s.h.
Topics vary: development of pragmatic competence in children's relation of general cognitive development and the acquisition of language. Prerequisite: consent of instructor. Same as 3:534, 103:321.

31:315 Seminar in Social Development 2 s.h.
Selected topics in social judgment and behavior. Prerequisite: consent of instructor.

31:316 Seminar: Problems in Developmental Psychology 2 s.h.
Consideration of selected methodological and theoretical issues in developmental psychology. Prerequisite: consent of instructor.

31:321 Seminar: Chemical Influences on Behavior 2 s.h.
Selected topics on the biochemistry of the central nervous system, with special emphasis on chemical systems affecting brain function and behavior. Prerequisite: consent of instructor.

31:331 Seminar: Behavior Theory 2 s.h.
Selected theory and data concerning systematic problems in animal behavior. Prerequisites: 31:237 and consent of instructor.

31:333 Seminar: Memory 2 s.h.
Contemporary theoretical viewpoints regarding nature of human memory, including discussion of recent research findings which bear on these viewpoints.

31:334 Seminar: Conditioning 2 s.h.
Method, theory, empirical outcomes in classical conditioning and relations to instrumental learning.

31:335 Seminar: Law and Psychology 2 s.h.

31:336 Seminar: Physiological Psychology 2 s.h.
Selected topics on anatomical and neuroendocrine bases of behavior. Prerequisite: consent of instructor.

31:341 Seminar: Mathematical Models in Perception and Psychophysics 2 s.h.
Various mathematical models in perception and psychophysics; detailed study of literature and models in signal detection theory.

31:343 Seminar: Statistical Analysis arr.
Selected topics, e.g., multivariate anova, measurement designs, nonparametric techniques, disproportionality, regression. Prerequisite: consent of instructor.

31:351 Seminar: Real Time Computing 2 s.h.
Consideration of minicomputer and microprocessor systems for on-line control of experiments and data collection.

31:352 Seminar: Psycholinguistics 2 s.h.
Topics vary: cerebral dominance, perceptual processing, and language; discourse theory; pragmatics-conversational competence; cognitive models of language. Prerequisite: consent of instructor. Same as 3:533, 103:320.

31:360 Seminar: Psychopathology arr.
Systematic consideration of selected issues in psychopathology.

31:361 Seminar: Clinical Psychology I arr.
Systematic review of selected topics. May be repeated. Prerequisite: consent of instructor.

31:362 Seminar: Clinical Psychology II arr.
Systematic review of selected topics. May be repeated. Prerequisites: 31:361 and consent of instructor.

31:363 Seminar: Aggression arr.
Selected topics related to aggressive behavior in human and nonhuman subjects.

31:365 Seminar: Psychotherapy arr.
Systematic consideration of selected issues in psychotherapy.

31:366 Seminar: Behavior Therapy arr.
Systematic consideration of selected issues in behavior therapy.

31:367 Seminar: Psychological Appraisal arr.
Systematic consideration of selected issues in psychological testing and assessment.

31:368 Seminar: Professional Concerns arr.
Selected topics, e.g., standards and procedures for review of studies with human participants, professional ethics, licensing, teaching of psychology, professional placement.

31:395 Seminar: Research Principles and Methods arr.
Specialized, advanced-research methods and techniques uniquely characteristic of disparate subject matter areas of different instructors. Prerequisite: consent of instructor.

31:461 Introductory Practicum arr.
Psychodiagnostic work in Psychology Clinic for Training and Research under supervision of clinical psychology faculty members. Prerequisite: permission of Clinical Training Committee.

31:462 Assessment Practicum arr.
Supervised practice in psychological techniques of behavior change. Prerequisite: permission of Clinical Training Committee.

31:463 Therapy Practicum arr.
Supervised practice and clinical experience in the application and evaluation of behavior therapies.

Recreation Education

Chair: Benjamin K. Hunnicutt
Faculty: *professor* John A. Nesbitt
assistant professors Seppo Iso Ahola, Dee Wayne Craig, Benjamin K. Hunnicutt, Michael L. Teague
instructor Richard MacNeil
Degrees offered: B.A., M.A.

A professional career in recreation and parks involves service to and with people, meeting human needs for personal, social and creative fulfillment in recreation and leisure activity. The field is characterized by growth and diversity. In the past 20 years, the number of people employed in it has doubled, to 200,000.

There are opportunities for professional placement throughout the United States and abroad, in a wide range of public park and recreation settings; voluntary and social agency recreation programs; therapeutic recreation programs; school, military service, commercial and industrial recreation programs; and teaching and research.

In its recreation aspect, the profession deals with the provision of worthwhile recreational opportunities in activities ranging from music and drama to sports and tourism. The park aspect deals with the planning, design, maintenance and management of recreational land and facilities.

In addition to professional preparation, Recreation Education offers courses in leisure research, the history of the cultural views and attitudes toward free time, and the study of leisure as a contemporary social and cultural issue.

The Department is also involved with service to and consultation with numerous leisure delivery systems throughout Iowa and the nation.

In terms of the "broader mission" of the University, Recreation Education offers service courses designed to acquaint the general college student with the role of leisure in his or her own life and the relevance of a liberal education to areas of life outside of the work place.

The Bachelor of Science Degree

Course requirements for the major are:

Professional Core (33 s.h.)

104:60 Foundations of Recreation
104:61 Recreation Leadership
104:101 Leisure Research
104:105 Introduction to Therapeutic Recreation
104:106 Recreation Program
104:108 Administration of Recreation I
104:198 Internship in Recreation
104:199 Internship in Recreation
27:56 First Aid

Area of Concentration (9-15 s.h.)

Community Recreation

For students preparing for positions in which they will be responsible for organizing and administering recreation programs, facilities and departments. This concentration is oriented primarily to municipal, district and county-level recreation and park departments.

Recreation Program Leadership and Supervision

For students preparing for leadership and program supervision positions with youth-serving agencies, settlement houses, armed forces and city park and recreation departments.

Required Courses

104:130 Park and Recreation Facility Management
104:135 Assessing Leisure Services
Plus three courses selected with adviser.

Therapeutic Recreation

Therapeutic recreation focuses on preparing students to organize, plan and lead recreation programs in treatment and nontreatment settings for people who are ill, handicapped, aged, disabled and disadvantaged.

Required Courses

104:120 Orientation to Rehabilitation Settings
104:121 Orientation to Special Populations
104:125 Role of Therapeutic Recreation in Rehabilitation
Plus three courses selected with adviser.

Leisure Studies

For students preparing for graduate work or with a major interest in leisure research or leisure as a contemporary social issue, or with an interest in diverse fields of recreation, such as outdoor, industrial recreation, etc. It is the most flexible of all preparations, and makes the maximum use of courses outside of the recreation education program. It is also ideal for students wishing to obtain a minor in Recreation Education.

Required Courses

104:140 Principles of Outdoor Recreation
104:145 Readings in Leisure
104:146 Contemporary Issues in Recreation and Leisure
Plus two courses selected with adviser.

Internship Opportunities

The recreation education program places special emphasis on practical experience and student involvement with the profession

and practitioners. Students are encouraged to attend state and national professional conferences, and every class in the professional core includes lectures by working professionals, as well as opportunities for field experience related to course content.

The practical emphasis is climaxed by a professional internship for a full semester in an agency and setting of the student's selection. The internship is designed to lead to professional placement. More than 50 departments, agencies and services throughout the state provide fieldwork and internship opportunities for students in the program.

Recreation Minor

Recreation education is an excellent minor for students majoring in elementary or special education.

Honors

Admission to the honors program in recreation education requires a formal application, completion of at least 30 semester hours of coursework at the University, completion of at least 9 of the 32 semester hours of required major coursework and at least a 3.0 grade point average on all college work attempted and on all work attempted in recreation education.

To graduate with honors in recreation education, the student must successfully complete six semester hours of honors work and must pass an honors examination. With the permission of the chair of his or her honors committee, the student may take three semester hours of Honors work in another department.

Master of Arts Degree Programs

The master's program is designed to prepare students for administrative, supervisory, and teaching positions in recreation systems and universities. It offers two areas of specialization: community recreation administration and therapeutic recreation administration. It may be taken with thesis (33 s.h.) or without (36 s.h.). An introduction to scholarly activities and research is provided through 104:101 Leisure Research, or equivalent, and preparation of a thesis or research report. The research will result in a modest contribution to knowledge, a review of a report or a synthesis or a design in the park and recreation field.

Community Recreation Administration

Emphasis in this area relates to the development and administration of programs in various settings, such as municipal departments, school, voluntary agencies, churches, the armed forces, state and federal agencies, industries, private organizations, etc. The emphasis within these programs may be on special population groups, such as the inner city and poverty groups, the aged, children and youth, or upon the meaning of leisure as a social phenomena with study directed toward the historical, philosophical, and social bases of leisure. Public administration and urban social planning are particular aspects of this area. To provide this emphasis, the program draws heavily from other disciplines, such as public administration, social work, urban and regional planning, sociology, geography, and psychology.

Therapeutic Recreation Administration

Therapeutic recreation relates to the development and administration of programs serving the mentally retarded, physically disabled, emotionally disturbed and aging in both institutional and community settings.

The program is directed toward the conceptual understanding of recreation's role in a comprehensive rehabilitation process, including both clinical and community facets and thus prepares the student to work with a broad range of disability areas in either a medical setting or the community. Through the use of related area courses, strengths in specific disability areas may be developed.

It is recommended that a person have as undergraduate background 10-12 semester hours of credit in courses such as abnormal psychology, psychology of adjustment, kinesiology, the mentally retarded, and aging. The student should also have skills in at least two program fields.

Financial Aids

Assistance is available in the form of graduate assistantships, research assistantships, teaching assistantships, and postmasters assistantships for doctoral candidates. This assistance is made available through the Department, as well as through a special program in Therapeutic Recreation Service for Handicapped Children.

Facilities

Students majoring in recreation education have the opportunity to gain extensive experience, paid or voluntary, through independent research in these and other locations: University of Iowa Psychiatric Hospital and Hospital Schools, University Recreation Services, Iowa City Parks and Recreation Department, Systems Unlimited, various retirement and convalescence homes, and Coralville Parks and Recreation Department.

Courses

Primarily for Undergraduates

104:60 Foundations of Recreation **1-3 s.h.**
Basic philosophical, historical, scientific foundations and developments in leisure and recreation; function and settings of organized recreation and survey of organizations and agencies concerned with recreation.

104:61 Recreation Leadership **3 s.h.**
Leadership principles and techniques; program activities.

104:65 Camp Leadership **3 s.h.**
Campcraft skills and techniques for camp counselor; ACA certification program.

104:67 Park and Recreation Agency Orientation **arr.**

104:120 Orientation to Rehabilitation Settings **1 s.h.**
Institutional and community rehabilitation programs encompassing psychiatric, retarded, physically handicapped, correctional, aging and aged.

For Undergraduates and Graduates

104:101 Leisure Research **3 s.h.**

104:105 Introduction to Therapeutic Recreation **3 s.h.**
Basic concepts of recreation's role in rehabilitation; organization and development of programs, approaches to understanding behavior of patients and adaptation of activities to basic disability areas.

104:106 Recreation Program **3 s.h.**
Planning and evaluation of recreation program; organization, promotion, utilization of resources, use of facilities and leadership.

104:108 Administration of Recreation I 4 s.h.
Programming, personnel, finance and budgets, liability, areas and facilities, other administrative aspects of recreation. Prerequisite: 104:106.

104:112 Colloquium 0 s.h.
Current issues; required of all senior and graduate students majoring in recreation.

104:121 Orientation to Special Populations 3 s.h.

104:122 Recreation Service for the Deaf-Blind arr.

104:125 Role of Therapeutic Recreation in Rehabilitation 3 s.h.
Role of therapeutic recreation in total institutional and community rehabilitation effort; specific attention given to cooperative role of therapeutic recreation in relation to total therapies program.

104:130 Park and Recreation Facility Management 3 s.h.
Introduction to recreation and park facilities management: personnel, program, financing, design and standards.

104:131 School and Community Recreation 3 s.h.
Role of schools in educating for leisure and survey of total community involvement in recreation through school, church, voluntary agency, commercial, private, industrial, institutional, military and municipal programs.

104:135 Assessing Leisure Services 3 s.h.
For students specializing in park and recreation administration; continuation of 104:108.

104:136 Recreation Program II arr.

104:140 Principles of Outdoor Recreation 3 s.h.
Administration of natural resources and public land on national, state, local and private levels; responsibilities of recreation profession to various phases of natural resource recreation and multiple use of public wild lands.

104:141 Camp Administration 3 s.h.
Public relations, personnel, finance and budgets, areas and facilities, ACA standards, administrative structure, legal aspects, evaluation and other administrative aspects of organized resident camping.

104:142 Principles of Outdoor Education 2-3 s.h.
Development and scope of outdoor education, educational significance, philosophies, organization, administration, methodology and content; particular attention to interpretive programs in ecology for recreation and education majors.

104:143 Practicum: Environmental Education arr.
Organization, administration, leadership and programming for school camp; integration into school curriculum. Same as 7E:138.

104:145 Readings in Leisure arr.

104:148 Contemporary Issues in Recreation and Leisure 3 s.h.
Survey of recreation and leisure in a modern society; human and technological values as they relate to leisure. Primarily for nonmajors.

104:155 Workshop Camp Program 1 s.h.

104:159 Introduction to Social Psychology of Leisure 3 s.h.

104:161 Alternative Leisure Life Styles 3 s.h.

104:162 Aging and Leisure 3 s.h.

104:180 Independent Study arr.
Investigation of problem related to specific area of interest.

104:181 Problems in Honors arr.

104:182 Statistical Analysis in Leisure Service 3 s.h.

104:198 Internship in Recreation arr.
Practical field experience arranged to include direct leadership, program planning and administrative procedures. Prerequisites: 104:108 and permission of instructor.

104:199 Internship in Recreation arr.
Continuation of 104:198.

Primarily for Graduates

104:201 Problems arr.
Consult Department chair before registering.

104:210 Graduate Practicum arr.

104:211 Graduate Practicum arr.

104:220 Concepts of Recreation and Leisure 3 s.h.
Advanced philosophical, historical, scientific foundations and developments in leisure and recreation; leadership principles; and selected case and field studies. Designed specifically for the graduate student without an undergraduate degree in recreation and/or park management.

104:228 Procedures in Therapeutic Recreation 3 s.h.
Designed to prepare therapeutic recreation specialists to assess clients, particularly handicapped children's recreational dysfunctions and handicaps, to determine their consequences and to direct therapeutic recreation activities which contribute to clients' maximum recreational functioning. Prerequisites: graduate status and consent of instructor.

104:229 Development of Therapeutic Recreation Services 3 s.h.
Initiation, improvement, expansion of therapeutic recreation service for handicapped, particularly handicapped children; practice in program evaluation procedures; parallel practices in related fields. Prerequisites: graduate status and consent of instructor.

104:230 Seminar: Administration of Recreation 3 s.h.
Problems of administration, supervision and programming in recreation programs.

104:231 Philosophy and Trends in Recreation 3 s.h.
Historical and philosophical development of attitudes toward leisure and recreation, emerging program patterns, current issues and education for leisure living.

104:232 Seminar: Therapeutic Recreation 2-3 s.h.
Seminar and special project approach to therapeutic recreation in specific setting such as psychiatric, physically handicapped, mentally retarded, correctional, etc.; administrative techniques and procedures unique to activity therapy programs.

104:234 Planning and Design of Recreation and Parks Areas and Facilities 3 s.h.
Principles, terminology, standards of design, planning, construction, use, maintenance of areas and facilities for recreation and physical education.

104:260 Theory and Methods in Social Psychology of Leisure Behavior 3 s.h.

104:301 Research: Recreation arr.
Research project development, selection, method and design.

104:310 Recreation College Teaching Internship arr.

104:401 Seminar: Thesis I arr.

104:402 Seminar: Thesis II arr.

104:420 Advanced Professional Seminar Recreation Parks: Leisure arr.

104:421 Advanced Professional Problems Recreation Parks: Leisure arr.

104:422 Advanced Professional Practicum Recreation Parks: Leisure arr.

Religion

Director of school: James C. Spalding
Faculty: *professors* Robert D. Baird, David R. Belgum, George W. Forell, J. Kenneth Kuntz, James F. McCue, George W. E. Nickelsburg, Jr., W. Pachow, Robert P. Scharlemann, James C. Spalding
professor emeriti Sidney E. Mead
associate professors John P. Boyle, Jay A. Holstein, George W. Paterson
assistant professors T. Dwight Bozeman, Helen T. Goldstein, Sheldon I. Pollock
Degrees offered: B.A., M.A., Ph.D.

A central goal of the School of Religion has always been to help as many students as possible—whether or not they are majoring in religion—to gain an understanding of the history and literature of the religions of mankind, and insight into the nature and meaning of the religious dimension in human culture. Such understanding is not only valuable for its own sake; it is essential for responsible participation in a religiously pluralistic American society and in a pluralistic world community. Many students at the University majoring in other areas elect courses in religion as a part of their general education program; some elect religion as a second major.

An undergraduate major in religion provides a foundation for graduate and professional study in the field of religion, but it is oriented more toward understanding than toward vocation. The School of Religion is not a theological seminary. It does not prepare students for ordination, although a number of its undergraduate majors later attend theological seminaries well prepared for study in those schools leading toward professional careers in churches and synagogues. Other majors continue their academic study of religion toward the M.A. and Ph.D. degrees to become specialists in the study and teaching of religion as a basic dimension of human culture.

Bachelor of Arts Program

For a major in religion, undergraduate students elect at least 24 semester hours of coursework in religion according to their own interest, provided they take a minimum of four 100-level courses in religion, one of which is ordinarily the majors' seminar (32:166 Senior Honors Seminar). Students majoring in religion also elect 12 hours in related courses such as anthropology, art, classics, history, philosophy, psychology, or sociology. The student must also fulfill the requirements of the College of Liberal Arts.

The selection of the foreign language must be approved by the adviser.

Honors Program

Religion majors eligible for the Liberal Arts Honors Program may obtain a degree with Honors through satisfactory completion of an Honors essay during the senior year.

Graduate Programs

The School of Religion seeks to prepare a select and limited number of graduate students to become specialists in the study and teaching of religion. Graduate study is offered in five areas, including 13 fields:

Jewish and Christian Scriptures
- Old Testament
- New Testament
- Post-Biblical Judaism

History of Christianity
- Early (to 1500)
- Modern (since 1500)
- American

Theology and Ethics
- Jewish
- Roman Catholic
- Protestant

World Religions
- History of Religions
- Intensive Study of Religion in India, China, or Japan

Religion and Personality
- Religion and Personality Development
- Religion and Health

Master of Arts

A score of 1050 on the GRE Aptitude Test and a GPA of 3.0 are ordinarily required for admission to the Master of Arts program.

The formal course requirement for the M.A. is 30 semester hours. Six semester hours of previously completed graduate study may be transferred toward the 30, with the approval of the student's advisory committee.

The student must demonstrate a reading knowledge of French or German, or of another foreign language which is related to his or her field of study and is approved by his or her advisory committee.

A thesis is also required. It need not be formally defended except when the student's advisory committee considers it desirable. Four hours of credit for thesis research may be applied toward the 30-hour requirement.

M.A. candidates should obtain more detailed information from the director of the School.

Master of Arts in Religion and Health

The contemporary study of the function and dynamics of religion in illness and health necessitates a combination of theoretical and clinical investigation of human experience. The University Hospitals provide the clinical setting for research and training in this program.

The program requires 30 semester hours of coursework. Four may be earned in thesis research. Six may be from another accredited graduate or professional school.

The program includes required courses in religion and personality, and in related fields of ethics and religions in America, together with other relevant courses. Knowledge of a foreign language, statistics, or another research tool may be required, at the discretion of the student's advisory committee. In addition to the general requirements for admission to the Graduate College, the School generally requires an on-campus interview of applicants to this program; however, the interview may be conducted off campus by an accredited member of the Association for Clinical Pastoral Education.

Doctor of Philosophy

A score of 1100 on the GRE Aptitude Test and a GPA of 3.2 are ordinarily required for admission to the Ph.D. program.

The student may elect one of two options for doctoral study. In the first option, in consultation with the School of Religion faculty, the student develops a broad program which will give him or her a knowledge of three of the five areas in which the School offers graduate study.

Major written qualifying examinations, covering coursework and readings in each of the three selected areas, provide an initial determination of the student's progress toward the ultimate objectives of the doctoral program. Students who hold the Master of Arts degree in religion, or the Bachelor of Divinity or an equivalent degree, must take the qualifying examinations within two years after beginning the doctoral program. Other students must take them within three years after beginning the program.

Generally, students must pass the Graduate School Foreign Language Tests in French or German before taking the qualifying examinations. In all cases, both tests must be passed at least 12 months prior to the comprehensive examinations.

If the student's program warrants it, and the faculty permits it, another language may be substituted for either French or German. There are also special language requirements in some areas. Students in the New Testament area, for example, must satisfy a requirement in Greek.

Not later than two months after passing all three qualifying examinations, the student and adviser must establish a three-member committee for comprehensive examinations. The committee will determine three subjects for the comprehensive examinations, including one subject closely related to the student's dissertation topic.

The plan of study for the comprehensive examinations must include ten semester hours of coursework at the 100-level or above outside the School of Religion with grades of "A" or "B"; ten semester hours of coursework in a field of religion outside the student's field of major interest, with grades of "A" or "B"; and a maximum of three papers indicating that the student possesses the skills required for doctoral-level work in his or her field of major interest.

The student must pass an oral examination on the dissertation. No more than 12 semester hours of credit will be allowed for the dissertation.

A student whose grade-point average in graduate study at the University falls below 3.0 will be placed on probation. A student who does not bring the average up to 3.0 within one semester ordinarily will be disqualified from further graduate study in the School of Religion.

A student choosing the second option pursues one of five separate programs:
- Judaism and Christianity in the Hellenistic World
- History of Theology and Religious Thought in the West
- Contemporary Theology and Religious Thought
- Studies Relating Theology and Other Academic Disciplines
- History of Asian Religions

The student may apply for admission to this program before or after enrolling for graduate study.

The student is expected to have passed the language requirements by the end of the second year of graduate study, and at least 12 months before taking the comprehensive examinations.

Beginning with the third semester and continuing each semester up to the semester of the comprehensive examinations, the student must submit to the faculty in his or her program area a copy of the paper best representing his or her work that semester.

Depending on the student's program, the comprehensive examinations will cover three or four fields. One field will be directly pertinent to the student's dissertation subject.

Within three months after passing the comprehensive examinations, the student must submit a dissertation prospectus to his or her adviser. The adviser will then assemble a dissertation committee to discuss the prospectus and guide the dissertation work.

A student who fails all of the comprehensive examinations may, with faculty approval, complete a thesis for a terminal Master of Arts degree.

Detailed information about any of the programs may be obtained from the director of the School.

Special Facilities

The University Hospitals and Clinics provide clinical opportunities for students in religion and personality, particularly in clinical pastoral education and the M.A. program in religion and health. Individual courses on such topics as death and dying and medical ethics also utilize hospital personnel and facilities.

Graduate Financial Aids

The School of Religion has available three types of departmental financial aid: a teaching-research fellowship (TRF); teaching assistantships (TA); and research assistantships (RA).

The TRF is awarded on the basis of proven academic excellence to an enrolling student who has not previously attended The University of Iowa. It provides support, including summers, for four years for a student holding a B.A., and for three years for a student holding an M.A. or M.Div.

TAs, either 1/4- or 1/2-time, are awarded to students on the basis of superior academic performance; ordinarily, first-year students are not eligible. They are limited to the academic year, and are evaluated and renewed annually. Students holding TAs work primarily in the undergraduate core courses.

Students holding RAs are assigned to a particular professor to assist him or her with research projects. RAs are also awarded on a yearly basis, to enrolling and to current students, 1/4- or 1/2-time, and reviewed annually.

Courses

Primarily for Undergraduates

32:1 Old Testament Survey 2 s.h.
Genesis through II Samuel.

32:2 Old Testament Survey 2 s.h.
I Kings through II Chronicles.

32:5 New Testament Survey 2-3 s.h.
Literature of New Testament in its historical setting.

32:31 Introduction to Catholicism 3 s.h.
Principal teachings of the Catholic faith; liturgical and moral doctrines and practices of the Catholic Church; developments since Vatican II.

32:35 Religion in Human Culture 4 s.h.
For undergraduate religion majors. Cannot be counted for both major and core course requirement. Same as 11:35.

32:36 Religion in Human Culture 4 s.h.
Continuation of 32:35. Same as 11:36.

32:45 Living Religions of the West 2-3 s.h.
Religious thought and practices in the Mediterranean area, Western Asia, North Africa, Europe, and Americas.

32:46 Living Religions of the East 4 s.h.
Study of religious beliefs and practices of peoples of India, China, and Japan. Can be taken for core course credit or as an elective. Same as 11:46, 39:46.

32:61 Varieties of Mystic Experience 3 s.h.
Examination of the writings of representative Western mystics, together with theological and psychological interpretations of their experience; offered alternate fall semesters.

32:72 Religion in American History, 1607-1800 2-3 s.h.
Protestant, Catholic, and Jew from the Colonial Era to the present. Same as 16:72.

32:79 Theologies of Liberation 2 s.h.
A study of the interaction between several liberation movements and religions, and the resulting change in the understanding of the nature and function of religion.

32:86 Religion and the Quest for Peace 2-3 s.h.
Attitudes toward war and violence, and strategies for peace in selected religious traditions.

32:87 Jews and Judaism 3 s.h.
The history of the Jews and their systems of belief from the biblical beginnings to the present day.

For Undergraduates and Graduates

32:100 God and Man in the Hebrew Bible 2-3 s.h.
God and man; God and nature; creation; sin and repentance in the Hebrew Bible.

32:101 Biblical Archaeology 3 s.h.
Contributions of Syro-Palestinian archaeological research to understanding historical and cultural backgrounds of biblical period.

32:102 Introduction to Rabbinic Literature 3 s.h.

32:103 Jewish Mysticism 3 s.h.

32:104 Medieval Jewish Philosophers 3 s.h.
May be offered as a survey of medieval Jewish philosophy or as a study of one specific philosopher.

32:105 Introduction to the Intertestamental Period 3 s.h.
History and theology of Judaism from 200 B.C.E. to 135 C.E.; readings from English translations of sources; archaeological evidence.

32:106 The Synoptic Gospels 3 s.h.
Interpretation of one of the first three Gospels, with reference to the other two.

32:107 Paul 3 s.h.
Aspects of Pauline theology in historical context.

32:108 Christian Ethics 2-3 s.h.
Specific nature of Christian ethics and survey of leading ethical themes, according to directive and dynamics of Christian kerygma.

32:109 History of Christian Ethics 2-3 s.h.
History of Christian social and ethical thought, tracing its development from Old and New Testaments to present.

32:110 Problems of Christian Ethics 2-3 s.h.
Moral choice as viewed by Christian faith; application to problems of marriage, vocation, economics, politics, race relations, war, and peace.

32:111 Biblical Hebrew I 3 s.h.
Vocabulary, grammar, oral expression, composition, selected readings.

32:112 Biblical Hebrew II 3 s.h.
Prerequisite: 32:111.

32:113 Readings in the Hebrew Bible 2 s.h.
Prerequisites: 32:111 and 32:112.

32:114 Biblical Aramaic 2 s.h.
Survey of Aramaic grammar; reading of Aramaic portions of the Old Testament and some related documents.

32:115 The World of the Old Testament 3 s.h.
Historical and intellectual background of Old Testament; focus on patterns of thought and religion in Near East and relation to Israelite religion.

32:116 Life and Afterlife in the Hebrew Bible 2 s.h.
The status of life after death and the obligations of the living to the dead in the Hebrew Bible.

32:117 Biblical Literature and Thought 3 s.h.
Literary analysis and interpretation of selected biblical texts in the light of their historical setting and impact on contemporary literature and culture.

32:118 Readings in Intertestamental Jewish Texts 2 s.h.
Reading and interpretation of two or three writings.

32:119 History of Christian Theology I: Patristic Era 3 s.h.
From end of New Testament period to end of 5th century.

32:120 History of Christian Theology II: Scholasticism and Reformation 3 s.h.
Scholastic theologies; their relation to the theologies of Luther and Calvin and to Council of Trent.

32:121 Protestant Faith 2-3 s.h.
Christian faith as understood by Protestantism; selected readings in major reformers and in contemporary Protestant theology.

32:122 Theology of Luther 2-3 s.h.
Analysis of religious thought of 16th-century reformer.

32:123 Religion and History of Ancient Israel I 3 s.h.
Study of crucial religious, historical developments in ancient Israel (to 800 B.C.) reflected in selected Pentateuchal, historical, prophetic texts of the Old Testament.

32:124 Religion and History of Ancient Israel II 3 s.h.
Study of crucial religious, historical developments in ancient Israel (800-150 B.C.) reflected in selected prophetic, wisdom, and apocalyptic texts of the Old Testament.

32:125 Prophecy in Biblical Israel 3 s.h.
Literary, historical, and theological analysis of the prophetic movement in ancient Israel and its impact upon today.

32:126 Theology of the Old Testament 3 s.h.
God, man, sin, and salvation, as advanced by Old Testament thought.

32:127 Theological Questions I 3 s.h.
Treatment of basic questions of religious thought such as the meaning of "God," nature of religious symbols, phenomena of skepticism and atheism.

32:128 Theological Questions II 3 s.h.
Discussion of Christology and its counterparts in non-Christian theologies; emphasis on subjectivity of experience, specifically the dislocation of self.

32:129 The Gospel of John 2-3 s.h.

32:130 The World of the New Testament 3 s.h.

32:131 World Order and Conflicting Values 3 s.h.
Study of major human problems (war, social injustice, economic underdevelopment, environmental decay); their relation to the values of individuals and society.

32:132 Religion and Women 3 s.h.
Study of sexism and its disavowal in biblical narrative, law, wisdom texts, Gospels, and epistles, and its contemporary impact.

32:133 History of Christianity to 1500 3 s.h.
History of Christian Church from its origins through its development in the Mediterranean world and in medieval Europe.

32:134 History of Christianity, 1500-Present 3 s.h.
Protestant and Catholic Christianity in age of European expansion; enlightenment; 19th- and 20th-century challenges and responses. Continuation of 32:133.

32:136 Christian Marriage 2 s.h.
Religious dimensions of sexuality, marriage, and family life from perspective of the Christian tradition. History of Christian attitudes together with contemporary developments.

32:137 19th- and 20th-Century Catholic Theology 3 s.h.
Principal developments in Catholic theology from 1800 to the present.

32:141 The Religious Thought of Moses Maimonides 2-3 s.h.
Selected portions of his *Guide of the Perplexed*.

32:142 Literature and Philosophic Thought 2-3 s.h.
The art of reading sacred literature.

32:143 Greek Jewish Literature 3 s.h.
Same as 14:109.

32:145 Living Religions of Mankind 3 s.h.

32:147 Values in Contemporary World 2 s.h.

32:148 Medieval Jewish Life 3 s.h.
Social, economic, and intellectual history of the Jews in the Middle Ages.

32:149 Buddhism in South Asia 3 s.h.
Critical discussion of the essential teachings of the Buddha, the Mahayana and Hinayana doctrines, history, practice, faith, and significance. Same as 39:164.

32:151 Religion in India 3 s.h.
Movements, doctrines, and religious practices in India, both in history and in modern expressions. Same as 39:167.

32:152 Religion in China 3 s.h.
Study of main religions in China. Same as 39:161.

32:153 Religion in Japan 3 s.h.
Study of main religions in Japan. Same as 39J:161.

32:154 Chinese Religious Texts 2-3 s.h.
Critical study of Confucian, Taoist, and Buddhist teachings. Texts in English translation. Same as 39:160.

32:155 Buddhist Sacred Texts 3 s.h.
Critical study on Mahayana and Theravada texts in translation. Same as 39:162.

32:156 Indian Religious Texts 2-3 s.h.
Examination of ancient and classical religious texts in translation. May be repeated for credit. Same as 39:163.

32:157 Anthropology of Religion 2-3 s.h.
Religious activity in folk and tribal setting; application of theories of origin and functions of religion in human affairs. Same as 113:142.

32:158 Sociology of Religion 3 s.h.
Comparative study of religious beliefs, practices; basis in social organizations; social consequences in literate societies. Prerequisite: 34:1. Same as 34:167.

32:159 Religion and Personality 3 s.h.
Religious factors and influences related to personality development and adjustment.

32:160 Psychological Study of Religion 3 s.h.
Historical survey of various psychological interpretations of religious experience and behavior from William James and Freud to present.

32:161 Faith, Doubt and Suffering 2-3 s.h.
Comparison of different views of the meanings of suffering as found in selected religious, psychological, and literary texts.

32:162 Religious Dimensions of Illness and Health 3 s.h.
Emotional and spiritual aspects of physical and mental illness; role of religion in therapy; religious-ethical questions in current medical practice.

32:163 Death and Dying 2-3 s.h.
Clinical, cultural, religious, and ethical dimensions of life-threatening illness.

32:164 Introduction to Bioethics 2-3 s.h.
Ethical dimensions of modern life sciences, with particular attention to problems of method.

32:165 Religion and Occult in Antiquity 3 s.h.
Investigation of the place of occult power in the early religions of Greece and Rome, its growth; magical influences in Graeco-Roman culture from outside during the pre-Christian period; the advent of eastern mystery cults. Same as 20:113.

32:166 Senior Honors Seminar 2-3 s.h.
Discussion of selected issues at the center of an academic study of religion; for majors in their senior year.

32:167 Asian Religions in the U.S. 3 s.h.
An examination of selected religious movements which exhibit Indian religious influence and are prominent in the U.S. today. Same as 39:170.

32:168 Mystical Experience and Social Concern 2-3 s.h.
Mystical experience and social concern; a study of the history and basic tenets of the Ramakrishna-Vivekananda movement. Same as 39:165.

32:169 The Bhagavad Gita and its Modern Interpreters 2-3 s.h.
Two-part course; part one examines the Bhagavad Gita in order to understand its teachings; part two deals with its modern use and interpretations. Same as 39:166.

32:170 Religion and the Contemporary Novel 3 s.h.
Investigation into religious dimensions of modern fiction.

32:171 Biblical Interpretation in Oratorio and Opera 3 s.h.
Same as 25:213, 33:170.

32:172 Uses of the Old Testament in Verse and Drama 3 s.h.
Literary, thematic analysis of the specific impact made by biblical literature on contemporary verse and dramatic works.

32:173 Religion and Literature 2-3 s.h.
Biblical themes, such as innocence and evil, morality and immorality, traced in the works of Melville and Hemingway.

32:174 Varieties of American Religion 2-3 s.h.
Survey of distinctive religious groups: Shakers, Mormons, Christian Scientists, Jehovah's Witnesses, Black Muslims, Pentecostals, etc. Same as 16:176.

32:175 Religious Thought in America: 1607-1860 2-3 s.h.
The religious factor in "the life of the mind in America," with reference to selected American thinkers. Same as 16:189.

32:176 Religious Thought in America 1860 to Present 2-3 s.h.
The religious factor in "the life of the mind in America," with reference to selected American thinkers. Same as 16:190.

32:177 American Puritanism 2-3 s.h.
Historical survey; analysis of main themes of redemption, the state, the family, woman, Indians, sex, etc. Same as 16:175.

32:178 Islamic Documents in Translation 2 s.h.
Readings in English translations of Muslim texts.

32:179 Faith and Reason in Islam 3 s.h.
Three approaches to religious problems: Kalam, philosophy, and mysticism.

32:180 Modern Jewish Theology 2-3 s.h.

32:182 Religious Thought in the 18th Century 3 s.h.
Trends in Western religious thought during the Age of Reason, 1660-1800.

32:183 Religious Thought in the 19th Century 3 s.h.
History and analysis of main developments in religious thought from 1800-1915.

32:184 Religious Thought in the 20th Century 3 s.h.
History and analysis of main developments in religious thought from 1915-present.

32:185 Religious Thought of Soren Kierkegaard 2 s.h.

32:186 Religious Thought in Tudor Stuart England 3 s.h.

32:187 The Theology of Paul Tillich 3 s.h.
Exposition and analysis of Tillich's thought.

32:188 Readings in Sanskrit Texts 3 s.h.
Advanced readings in Indian religious and philosophical texts in the original Sanskrit. May be repeated for credit. Same as 39:188.

32:189 Readings in Religion arr.

32:190 Contemporary Issues in Religion 2-3 s.h.
Analysis of problem areas: nature of religion, relationship of religions in pluralistic world, future of religion. Prerequisite: 11:35-36 or 32:35-36.

32:191 Buddhist and Hindu Iconography 2-3 s.h.
Historical development of religious imagery of Buddhism and Hinduism in India, Central and Southeast Asia, China, and Japan. Same as 1H:114.

32:192 Art of Islam 3 s.h.
Islamic architecture, painting, minor arts, in Spain, North Africa, Egypt, Turkey, Syria, Iraq, Iran, Afghanistan, India, 600-1800 A.D. Same as 1H:113.

32:193 Honors Tutorial 2-3 s.h.

32:194 Honors Essay 2-4 s.h.

32:195 Art of India I 3 s.h.
To 1000 A.D. Same as 1H:115, 39:181.

32:196 Art of India II 3 s.h.
From 1000 A.D. to modern times. Continuation of 32:195. Same as 1H:116, 39:182.

32:197 Early Christian and Early Byzantine Art 3 s.h.
Same as 1H:135, 14:113.

32:198 Egyptian and Mesopotamian Art 3 s.h.
Same as 1H:110.

32:199 Painting of India 3 s.h.
Same as 1H:118, 39:168.

32:205 Research: Religion arr.

32:207 Seminar: Problems in New Testament Interpretation 2 s.h.
Different problems discussed each semester; knowledge of Greek required.

32:210 Seminar: History of Theological Ethics arr.
Intensive study of ethical thought of one or more Christian theologians.

32:211 Seminar: Problems of Old Testament Criticism 2 s.h.
In different years attention directed to Pentateuch, Old Testament poetry, wisdom, or apocalyptic literature.

32:214 Seminar in Medieval Jewish Thought arr.
Jewish interpretation of the Bible (to 1400). Offered fall 1977.

32:215 Seminar: Buddhism arr.
Research and reading in selected Buddhist thinker or movement. Same as 39:263.

32:216 Seminar: Religion in India 3 s.h.
Research and reading in selected Indian thinker or movement. Same as 39:267.

32:217 Proseminar: Methodological Issues in the History of Religions 3 s.h.
Discussion of various methodologies for study of religions with goal of arriving at viable method.

32:218 Seminar: Problems in the History of Religions 3 s.h.
Research and reading in methodological and interpretive problems.

32:224 Proseminar: Introduction to Systematics 3 s.h.
Introduction to theological thinking, treating such basic questions as the kinds of theological systems, resources, methods, aims, and characters of religious thought.

32:225 Seminar: Contemporary Theology arr.
Intensive study of one or more theologians or theological problems.

32:226 Seminar: History of Protestant Thought arr.
Issues in modern period (1600-present).

32:227 Proseminar: History of Theology and Religious Thought in the West 2 s.h.
Introduction to the character, scope, and methods of the history of religious thought, including the history of the writing of such history.

32:229 Seminar: Reformation Theology arr.
Theology of one great Protestant reformer of the 16th century.

32:230 Seminar in Historical Theology 3 s.h.
Intensive study of a particular problem or theologian.

32:233 Seminar in Recent Catholic Theology arr.
Study of a contemporary theologian or of a particular problem in present Roman Catholic theology.

32:235 Religion and Black Culture 3 s.h.
Same as 45:220.

32:237 Studies in Christian Origins I 3 s.h.
Ministry of Jesus and beginning of the Church; variety of Christian beliefs and practices in 1st century.

32:238 Studies in Christian Origins II 3 s.h.
Development of Christianity to late 2nd century; character and relationships of Jewish-Christianity, gnosticism, and emerging orthodoxy.

32:251 Perspectives on the Process of Aging arr.
An investigation into factors impinging on the process of aging in America; religious, psychological, economic, physical aspects of aging. Same as 115:501.

32:254 Seminar: Clinical Pastoral Education arr.
Supervised clinical experience in various departments of Medical Center.

32:257 Religious Perspectives in Counseling Psychotherapy 3 s.h.
Review of current approaches to counseling for pastors, teachers, religious workers; supervised experience in clinical setting.

32:259 Seminar: Religion and Personality arr.
Current issues in the theological and psychological interpretation of human behavior.

32:261 Seminar: Topics in Religion and Health arr.

32:263 Seminar: Problems and Methods in Studying and Teaching About Religion 2 s.h.
Same as 7S:263.

32:264 Practicum: Construction of Teaching Materials 1 s.h.
Same as 7S:264.

32:275 Seminar: American Religious Thought arr.
Study of selected thinkers. Same as 16:275.

32:276 Seminar: American Puritanism arr.
Same as 16:276.

32:280 Human Rights and World Community arr.
Same as 30:365, 19:280, 45:361.

Rhetoric Program

Coordinator: Donovan J. Ochs
Faculty: *professors* Margaret B. McDowell, Donovan J. Ochs
associate professors William G. Clark, Lou B. Kelly, Lois B. Muehl
assistant professors Richard S. Hootman, Richard E. Koch, Gene H. Krupa, Cleo Martin, Douglas M. Trank

The Rhetoric Program offers students direct opportunities, through their own oral and written communication, to evaluate their experiences and to explore and formulate possibilities for their personal and intellectual growth.

Responsibly using various sources of information and investigating, analyzing, evaluating, and responding to the ideas, beliefs, and attitudes of other writers and speakers are integral functions of rhetoric coursework. However, rhetoric instructors' primary responsibility is to help students clarify their own thinking and improve their own communication.

Satisfactory proficiency in rhetoric is a requirement for baccalaureate graduation from the College of Liberal Arts (see College of Liberal Arts: Basic Requirements).

The Rhetoric Program's Reading and Writing Labs are available to all University students, on a voluntary basis (see "Services for Students").

Courses

For Undergraduates

10:1 Rhetoric 4 s.h.
Instruction and practice in speaking, writing and critical reading with the focus on exposition and criticism. Develops competence in analyzing, organizing and developing ideas; locating and using library resources for amplifying and supporting ideas; adapting discourse to readers and listeners.

10:2 Rhetoric 4 s.h.
Continued instruction and practice in oral and written communication with the focus on critical thinking, research and argumentation. Develops competence in research procedures; locating and evaluating information and diverse points of view; analysis and responsible use of evidence; reasoned interpretation of substantive matters. Culminates in convincing essays and speeches, and a research paper.

10:3 Rhetoric 4 s.h.
Instruction and practice in speaking, writing and critical reading with the focus on exposition, critical thinking, research and argumentation. Develops competence in research procedures: locating and evaluating information and diverse points of view; analysis and responsible use of evidence; reasoned interpretation of substantive matters. Culminates in convincing essays and speeches, and a research paper.

10:4 Rhetoric 2 s.h.
Instruction and practice in written communication only. See 10:3 for focus and expectations.

10:8 Rhetoric 2 s.h.
Students with major difficulties with college-level reading work to improve their reading proficiency through this course. Regular assignments combine the use of Reading Lab materials, textbooks from current University courses and library resources. Students are encouraged to develop efficient study skills, vocabulary growth, reading comprehension, test-taking ability, enjoyment of reading.

Open to any student not enrolled in another Rhetoric course.

10:9 Rhetoric **2 s.h.**
Engages the student in written communication with a teacher, who responds first to the writer's ideas, then focuses on particular problems as they occur in particular writing situations or assignments. Open to any student not enrolled in another Rhetoric course.

Russian

Department chair: Ray J. Parrott, Jr.
Faculty: *professor* Norman Luxenburg
professor emeritus Helene Scriabine
associate professors Ray J. Parrott, Jr., Harry B. Weber
assistant professor Christopher A. Wertz
instructors Miriam J. Gelfand, Catherine Lipelis
Degrees offered: B.A., M.A.

The purpose of the Russian program is to give students training in both the written and spoken Russian language and in Russian literature. An important secondary objective of the program is an understanding and appreciation of Russian civilization and culture. Study of Russian is seldom an end in itself but rather a means to some other vocation. The Department encourages all of its beginning students to pursue a joint major and to develop their interests in other fields.

With the increasing importance of Russian as a language of science and commerce, many students find that training in the language is an important asset to careers in the natural and physical sciences, engineering, medicine and business. Students of journalism, library science and the social sciences also have strengthened their career preparation through the study of Russian. Some students major in Russian before going into law, international relations or another profession; others as preparation for graduate work in Slavic languages and literatures, comparative literature, English or other humanistic disciplines.

Russian majors with the B.A. and the required education courses occasionally seek teaching careers in secondary schools. A number of governmental agencies regularly interview prospective candidates for employment with advanced training in Russian. Students who develop an excellent facility with the language on occasion pursue careers in communications, literary and technical translation, and interpretation. This age of rapid communication and transportation in a pluralistic society increasingly demands a competence in other than one's native language.

Bachelor of Arts Program

Students who major in Russian must meet the general requirements for a degree in Liberal Arts and earn at least 26 semester hours of credit in advanced Russian courses:

41:111-112 Intermediate Composition and Conversation	8 s.h.
41:113 Advanced Composition and Conversation	3 s.h.
41:171-172 Readings in Representative Russian Literature	6 s.h.
Three of the following:	
41:151 Russian Literature in Translation (1800-1860)	3 s.h.
41:152 Russian Literature in Translation (1860-1917)	3 s.h.
41:181 Soviet Literature in Translation	3 s.h.
41:185 Russian Culture	3 s.h.
41:191 Russian Civilization	3 s.h.

For a more complete area background, Russian majors are urged to include related courses in economics, geography, history or political science among their elective courses.

All students majoring in Russian are strongly encouraged to enroll in the one-semester course 41:127 Phonetics and Pronunciation. Instruction in business Russian may be arranged with the consent of the instructor by enrolling in 41:108 Special Readings.

The requirements for a minor in Russian can be fulfilled by eight semester hours of third-year Russian.

The Honors Program

Russian majors of junior or senior standing with a grade-point average of at least 3.0 both in Russian and overall may enroll in the Honors Program in Russian. An extensive reading program with discussions, regular reports and a semester paper constitute each work unit of two semester hours. Students may take up to eight semester hours of Honors in Russian.

Summer and Study Abroad Programs

The Department regularly encourages undergraduate and graduate students to participate in intensive programs of language study both in the United States and in the Soviet Union. In recent years an increasing number of students have studied in summer and semester programs at Leningrad State University under the auspices of the Council on International Educational Exchange. Other students have accelerated and refined their Russian language skills in various intensive summer programs at major American universities. Inquiries should be directed to the Russian Department office.

Master of Arts Program

The graduate program in Russian offers a major emphasis in either literary or language study.

The focus in literary studies is on the development of Russian literature, both as a national phenomenon and as a part of European culture. Students are expected to analyze writers' styles, perceive literary techniques, recognize literary influences, and develop the ability for sound criticism of form, content, and language of works in all genres.

Students electing an emphasis on language studies focus on the historical development of Russian, in addition to advanced study of contemporary phonology, morphology, syntax, and stylistics.

Candidates for the master's degree must have completed the equivalent of the undergraduate major in Russian. Deficiencies in previous training may be removed by taking appropriate courses.

Candidates for the master's degree are required to complete a minimum of 30 semester hours of graduate work, with or without thesis. This program consists of courses over and above those which constitute an undergraduate major in Russian and should include courses in related fields such as comparative literature, history, philosophy and other languages. Four to eight semester hours may be received for thesis preparation. The candidates must pass a written and an oral examination; they must also demonstrate a reading knowledge of either French or German.

Financial Aid

Aid is available to graduate students in the form of tuition scholarships, University fellowships, and teaching and research assistantships. It is awarded annually on a

competitive basis to the best qualified applicants. Ordinarily teaching assistantships are not awarded to first-year students, though exceptions are sometimes made on the basis of advanced language skills. Applications are considered only from students who have been admitted to the Graduate College. Inquiries should be addressed to the departmental office.

Coursework for Nonmajors

The Department offers introductory courses in the Russian language for students who have specific language requirements. There are special reading courses designed to give students from other fields an opportunity to acquire a reading proficiency in Russian in either the social or natural sciences. A scientific Russian course is offered for students in sciences who need to develop reading ability for research purposes. Some classes are open to University students from all departments and are offered in English. These include survey courses in Russian literature, culture, and civilization, readings in Soviet literature, and monograph courses on Tolstoy and Dostoevsky.

Special Activities

Each year the Department presents several guest lecturers and sponsored films. Students sometimes put on Russian plays. Russian Circle is an organization open to graduates and undergraduates for social activities. Participation in Russian Circle also provides students with the opportunity to practice speaking and to improve their Russian with other members of the Department.

The Language Laboratory

The University Language Laboratory provides facilities for language learning, teaching and research. Equipment in the lab includes standard and short wave radios, tape recorders, record players, soundproof recording rooms and drill rooms. An electronic classroom, a soundproof workroom and a library of tape and disc recordings are also available.

Courses

For Undergraduates and Graduates

41:101 Elementary Russian 4 s.h.

41:102 Elementary Russian 4 s.h.
Prerequisite: 41:101 or equivalent.

41:103 Russian for Reading 3 s.h.
Emphasis on reading scientific and technical Russian material; for students, especially those majoring in sciences, who need primarily to develop reading ability for research purposes.

41:104 Russian for Reading 3 s.h.
Prerequisite: 41:103 or equivalent.

41:105 Second-Year Russian 4 s.h.
Standard second-year course recommended for students satisfying their foreign language requirement for B.A. degree and desiring further training in active use of the language. Prerequisite: 41:102 or equivalent.

41:106 Second-Year Russian 4 s.h.
Prerequisite: 41:105 or equivalent.

41:108 Special Readings arr.
Prerequisite: 16 semester hours of language instruction.

41:109 Intensive Conversation 3 s.h.
Prerequisite: 41:106 or equivalent.

41:110 Intensive Conversation 3 s.h.
Prerequisite: 41:109 or equivalent.

41:111 Intermediate Composition and Conversation 4 s.h.
Prerequisite: 41:106 or equivalent.

41:112 Intermediate Composition and Conversation 4 s.h.
Prerequisite: 41:111 or equivalent.

41:113 Advanced Composition and Conversation 3 s.h.
Prerequisite: 41:112 or equivalent.

41:114 Advanced Composition and Conversation 3 s.h.
Prerequisite: 41:113 or equivalent.

41:127 Phonetics and Pronunciation 2 s.h.
Prerequisite: 41:102 or equivalent.

41:145 Grotesque Fiction Gogol 3 s.h.

41:151 Russian Literature in Translation (1800-1860) 3 s.h.
Conducted in English.

41:152 Russian Literature in Translation (1860-1917) 3 s.h.
Conducted in English.

41:155 Tolstoy and Dostoevsky 3-4 s.h.
Conducted in English.

41:171 Readings in Representative Russian Literature 3 s.h.
Conducted in Russian. Prerequisite: 41:112 or equivalent.

41:172 Readings in Representative Russian Literature 3 s.h.
Conducted in Russian. Continuation of 41:171, but may be taken as independent unit. Prerequisite: 41:112 or equivalent.

41:181 Soviet Literature in Translation 3 s.h.
Conducted in English.

41:185 Russian Culture 3 s.h.
Conducted in English.

41:191 Russian Civilization 2-3 s.h.
Conducted in English.

41:199 Honors arr.
May be repeated to maximum of 8 s.h. Prerequisite: consent of Department.

Primarily for Graduates

41:201 Russian Literature to 1800 3 s.h.

41:203 Structure of Russian I 3 s.h.

41:204 Structure of Russian II 3 s.h.
Continuation of 41:203 but may be taken as independent unit.

41:205 Russian Syntax 3 s.h.

41:206 Russian Stylistics 3 s.h.

41:211 19th-Century Russian Literature 3 s.h.

41:212 Modern Russian Literature 1880-1917 3 s.h.
Continuation of 41:211 but may be taken as independent unit.

41:215 Russian Poetry 2 s.h.

41:231 Soviet Literature 3 s.h.

41:244 Literary Criticism 3 s.h.

41:245 Problems in Soviet Lit Theory and Criticism 3 s.h.
Same as 46:245.

41:249 Proseminar: Research Methods 1-2 s.h.

41:261 History of the Russian Language 3 s.h.

41:263 Old Church Slavonic 2 s.h.

41:279 Independent Research arr.

Science Education

Head: Robert E. Yager
Faculty: *professor* Robert E. Yager
associate professors George W. Cossman, Vincent N. Lunetta, John E. Penick, Darrell G. Phillips, James A. Shymansky, John T. Wilson
assistant professors Edward L. Pizzini, Daniel S. Sheldon
lecturers Lloyd H. Barrow, Robert J. Boes, Marvin Christenson, Paul A. Christiansen, John B. Cook, Gary E. Downs, Jerry J. Doyle, Charles M. Emslie, Charles F. Philp, Louis A. Gatta, Donald Hamilton, Dean Hartman, Darrel Hoff, Paul H. Joslin, George Magrane, Vincent D. Mahoney, Eileen Mays, Paul Otto, Joyce Peterson, Ray Reeves, John R. Shinpoch, R.J. Vanden Branden, James C. Wright
Degrees offered: M.A.T., M.S., Ed.S., Ph.D.

Undergraduate Program

The undergraduate program in Science Education provides a major for students who are preparing to teach in secondary schools, for students who need an interdisciplinary science background for other professional programs, as well as for students interested in a variety of science disciplines. The program provides some depth of preparation while encouraging breadth of experience—a combination attractive for preparation for secondary school teaching, some profes-

sional schools, medicine, physical therapy, and certain specialized and interdisciplinary graduate areas. The program in elementary education with a concentration in science is recommended for elementary majors with interest in science as a primary field.

Graduate Programs

Certification Only

This is a special classification for graduate students who have earned bachelor's degrees without fulfilling requirements for a teaching certificate. The requirements include fulfilling all science, history and philosophy of science requirements for graduation from the teacher education program in science at The University of Iowa. In addition, the normal sequence of education courses results in 20 to 28 additional hours of credit. No degree objective is implied, although it is possible to request a change in graduate status. In such instances, the normal processing and faculty review would occur before any changes could be made.

M.A.T. in Science Teaching

This degree is designed primarily for persons who decide they would like to become teachers after they have completed a bachelor's degree. It features advanced work in science along with the courses required for certification. It is a means by which students can attain a master's degree and certification at the same time. (Other Science Education degree programs assume that the candidate has already completed a certification program.)

M.S. without Thesis

This degree is the one most appropriate for teachers who plan to remain in the classroom. It is not a research degree and is not recommended for candidates who plan to continue their education beyond the master's level. It is a 38-hour program requiring 26 hours in the sciences (further preparation in the content fields where the teacher is assigned) and 12 semester hours of advanced work in science education.

M.S. without Thesis, for Elementary Teachers

This degree is similar to the one above and has the same general requirements, but is designed for persons with general preparation as elementary teachers who have not emphasized science as undergraduates. The primary difference is that courses in general science typically are used as one of the areas of science. The other area of science is also broadly defined, i.e., biology, physical science or earth science.

M.S. with Thesis

This degree is appropriate for candidates who plan to continue for the specialist degree or the Ph.D. It features a thesis which can emphasize a problem in science education. If it is scientific research, the candidate must locate an appropriate professor in the science field to codirect the thesis work. The program includes 30 semester hours, of which 10 hours must be completed in science education and 20 hours in two fields of science.

M.S. for Science Supervisors

Since the needs of supervisors of science are often unique, a special program of required courses is outlined. Although this degree could be with thesis, most candidates find it desirable to complete additional coursework in lieu of the formal thesis. Nonetheless, research and work with program evaluation are required. Such pilot studies, which must include publishable results, usually center upon very practical curriculum problems. The special M.S. degree meets all the qualifications of the regular M.S. degrees. However, there are fewer electives required for this program, since special supervisory courses and experiences are required. (Problems remain in Iowa for special endorsement and certification as a supervisor without meeting all requirements for endorsement as a principal. However, other states have offered such certification upon completion of the program as outlined.)

Professional Improvement

This is a special status for graduate students who wish to complete additional coursework without a further degree objective. Students so classified must be formally accepted as P.I. students and must meet regularly with an adviser. At the same time, there is great latitude in the types of courses and individual instruction sequences that are possible. Many students interested in special workshops, seminars, conferences and institutes are admitted as students in this category. If such students wish to apply for a degree at a later time, all credit completed while admitted for P.I. must be evaluated and the application is reviewed as if it is a new one for admission purposes.

Educational Specialist Degree

The Ed.S. is an intermediate degree between the master's and the Ph.D. degrees. It is recommended for supervisors (state, regional or local) as well as for instructors in community colleges and/or small four-year liberal arts colleges. The degree consists of 60 semester hours of work beyond the bachelor's degree, of which 28 semester hours are in supportive science, 10 semester hours in related fields and 22 semester hours in science education (including research and internship credit).

Doctor of Philosophy

This degree is available to qualified candidates who aspire to college and university positions as science educators; major supervisory posts in national, state and local systems; positions as teachers of the various sciences in small liberal arts colleges; positions as intructors of general education science courses at major colleges; positions as research directors in science education, and coordinators of allied health and engineering education programs. Two-thirds of the work is in two areas of science, with one-third centered in education.

The Ph.D. candidate in science education is expected to complete two tools of research before taking comprehensive examinations. These can be satisfied before degree candidacy or during the first registrations for coursework which is more directly a part of degree requirements. The tools of research may be fulfilled by the candidate in science education by establishing competency in two of the following:

Statistics (six semester hours of graduate work);
Computer programming and/or data processing;

Research design in science education (completion of pilot study); and
Competency in French, German or Russian.

The candidate's adviser is charged with certifying competency in the two tool areas.

Special Programs

A philosophy and history of science program as it relates to scientific literacy and science teaching is a special facet of the Science Education program at Iowa. The extensive program for motivated and high-ability secondary school students is another unique feature.

The foundations of science program is a course sequence providing science courses for nonscience majors. It involves 200 students per year. Unique elementary and secondary education programs are sponsored by the science education programs with the College of Liberal Arts and the College of Education.

Iowa-UPSTEP is a federally-funded program developed and operating at the University. Some of the unique features of Iowa-UPSTEP model include: a professional sequence for undergraduates closely linked to the science major and general education requirements; a philosophy and history of science component; a program that is largely field-based; early identification of participants—perhaps through a Secondary Student Training Program (SSTP) experience; and an in-service component designed to assist curriculum revision in Iowa schools.

Iowa-ASSIST is a special program in science education which involves 600 in-service teachers each year in special curriculum revision and implementation efforts. Summer and academic year workshops provide the basic mode of operation for the program. Associated with Iowa-ASSIST is a materials center which provides printed and laboratory materials for workshop and school program implementations.

Special Facilities

The physical facilities for science education programs at The University of Iowa are exemplary. The Science Education Center is located in the new Physics Building near the center of the campus. The Science Education Center consists of the seventh, fourth and part of the third floor of the east wing (the instructional laboratories) of the Physics Building.

The main office of the Science Education Center is located on the fourth floor. Other general facilities on the fourth floor include a photographic laboratory, a departmental conference room and a library and counseling center. A suite of offices for the student program activities is also located here. Also included is space for the elementary school focus of the program. Instructional space includes a methods laboratory for the elementary school science methods course and two large teaching laboratories for the foundations of science sequence.

Facilities on the third floor include an interactive curriculatorium and secondary methods laboratory, a curriculum and materials resource center, and an office for coordinating Iowa-ASSIST, a model in-service program for assisting schools with implementing new national curriculum programs in Iowa schools. A Resource Center, including both living and expendable materials, is also located here.

The seventh floor includes central offices for the history and philosophy of science facet of the science education program at Iowa and for the secondary school teacher education program. A self-instructional laboratory including laboratory and audio-visual materials is located here; also a large seminar room used as an instructional center for some of the secondary teacher education sessions, including many facets of the Iowa-UPSTEP model. The seventh floor also includes multiple offices for graduate assistants, a commons area for small-group discussions and individual work, and two large areas for small-group and committee work.

Financial Aids

Ten teaching assistantships are available, usually for Ph.D. candidates. Five research assistantships are also available for graduate students. At least ten administrative and service assistantships are also available for qualified graduate students.

Courses

Primarily for Undergraduates

97:20 Investigations in Science arr.
Special projects in science for high-ability secondary school students. May be repeated.

97:45 Science Survey arr.
Consideration of broad conceptual schemes of science; attention to societal implications of scientific research and modern technology.

97:46 Science Survey arr.
Experiences in laboratories where science and technology are examined; individual projects characterize major effort; several areas within the University structure provide focus for courses.

97:55 Science Foundations I 3-4 s.h.
Study of selected concepts in the basic science areas; emphasis on self-directed laboratory investigations. Science core requirement for elementary education and special education majors.

97:56 Science Foundations II 3-4 s.h.
Continuation of 97:55; includes additional investigations of selected concepts in the basic sciences. Science core requirement for elementary education and special education majors. Prerequisite: 97:55.

97:99 Honors Research Project arr.

For Undergraduates and Graduates

97:102 Societal and Educational Applications of Earth Science Concepts and Topics arr.
Brief systematic review of principles of geology; emphasis on laboratory and field work dealing with minerals, rocks, fossils, maps and local geology. Primarily for teachers with minimum training in earth sciences.

97:103 Societal and Educational Applications of Biological Concepts arr.
Modern theories of molecular biology; careful consideration made of new materials prepared by national curriculum groups.

97:104 Science Foundations III arr.
Combination of 97:55 and 97:56. Satisfies science core requirements for elementary education and special education majors. Prerequisite: minimum of 6 s.h. of science excluding 97:55 and/or 97:56.

97:105 Societal and Educational Applications of Selected Concepts of Physics arr.
Provides background for consideration of modern physics ideas especially important in secondary school; reference made to various national programs in physics and physical science.

97:106 Societal and Educational Applications of Chemical Concepts arr.
Updates and strengthens content backgrounds of teachers; attention given to new curriculum materials in chemistry.

97:110 Seminar: Selected Science and Education Topics arr.
Review of research in field; special reference to applicability in teaching.

97:112 Advanced Science Foundations arr.
Continuation of 97:56; emphasis on independent laboratory investigation of problems in the basic science area. May be repeated. Prerequisites: 97:55 and 97:56 or a minimum of 8 s.h. of science.

97:119 Directed Study arr.

97:128 Meaning of Science 2-3 s.h.
Critical examination of the scientific enterprise from the viewpoint of social, ethical and cultural, as well as epistemological, concerns.

97:130 Science in Historical Perspective 2-3 s.h.
Perspectives on science and relationship of science to technology, humanism, society and the state through examination of the time-related aspects of each.

97:140 Problems in Integrating the Teaching of Environmental Science 3 s.h.
For preservice teachers who plan to implement environmental studies programs in secondary schools; content from government, economics, earth science, biology, psychology, sociology, religion and other areas.

Social Studies Education

Chair: John H. Haefner
Faculty: *professors* John H. Haefner, Robert M. Fitch
Degrees offered: B.A., M.A., Ph.D.

Undergraduate Program

The major in social studies education is a broad, interdisciplinary nonprofessional major. It provides an excellent foundation for careers in law, social work, religion, urban planning and development, and government service at all levels. Its major purpose, however, is to provide a broad, comprehensive education for students preparing to teach in secondary schools. Together with the professional requirements for certification, this major meets the standards established by the North Central Association of Colleges and Secondary Schools.

There is a good deal of flexibility in the program and, in consultation with an adviser, it can be tailored to the needs and interests of the individual student. All of the coursework is taken within the seven cooperating departments.

The B.A. in social studies consists of a total of 60 semester hours, including: 12 semester hours in history; 12 semester hours each in economics, political science, and sociology; a minimum of three semester hours in geography; and nine semester hours in geography, anthropology or psychology. Students pursuing a social studies education major will be engaged in survey courses introducing them to the various social sciences. But many of the departments offer independent study and readings as alternatives to formal classes.

There is no separate Honors Program in social studies education. Students who qualify are encouraged to do their Honors work in the social science department in which they wish to concentrate their work.

Admission Requirements

Students wishing to major in social studies education must have the permission of an adviser. Transfer students must have earned a minimum grade-point average of 2.5 on all work done in the subjects of the seven cooperating departments in order to be admitted to the program. Approval of candidacy for the bachelor's degree will be granted only to students who have a 2.5 grade-point average in all college work undertaken in the cooperating departments.

Master of Arts

The interdisciplinary nature of the Master of Arts degree in social studies education is of special interest to classroom teachers in secondary education, to instructors in junior and community colleges, and to educators wishing to concentrate in social studies curriculum and instruction.

Graduates of this program are classroom teachers and chairs of social studies departments in junior and senior high schools. Some are serving as curriculum consultants for school districts, while others are staff members in community colleges. A few have found the degree excellent preparation for their professional work in various correctional and penal institutions. For a small number, the master's program has provided access to civil service positions at various levels of government.

In the master's program, the candidate may elect to take the degree with or without thesis. Both plans require a minimum of 38 semester hours, distributed in one of two ways.

In Plan A, the candidate completes at least 10 semester hours of coursework in each of three of the seven cooperating departments: Anthropology, Economics, Geography, History, Political Science, Psychology and Sociology. The remaining eight semester hours may be taken in one of the three departments, or distributed among them.

In Plan B, the candidate does his or her work in two of the cooperating departments and in the College of Education. Under this plan, the student takes a minimum of 10 semester hours in each of the two social sciences he or she has chosen, and a maximum of 10 semester hours in education. The remaining eight semester hours may be taken in one of the social science fields or be distributed between them.

Both plans require a minimum of nine semester hours in graduate courses numbered 200 or over. One such course must be taken in each of the three fields included in the program.

Comprehensive examinations are required. The written portion consists of a six-hour examination over the fields in which the candidate has distributed his or her work. The oral portion is conducted by the candidate's committee as a whole.

Candidates in this program may have a wide variety of educational experiences, depending on the fields of study chosen. Small group instruction, seminar work, independent study and reading, experience with computers, internships and laboratory work are among the possibilities.

Admission Requirements

A student wishing to major in social studies for a master's degree must present a minimum of 20 semester hours of credit in the area of social studies earned as an undergraduate in an accredited insitution. The transcript of the applicant must show a minimum grade-point average of 2.5 on all work undertaken in the social studies up to the time of application. After having declared a social studies major, a student must maintain a 2.5 grade-point average.

Doctor of Philosophy

Graduates with a doctorate in social studies education can be found in a variety of professional positions. Some have gone into administration in institutions of higher education and are serving as presidents, provosts or deans of faculty or graduate studies. Some are department chairs in colleges of education or curriculum directors in large school districts. Many are engaged in teacher education programs in colleges and universities. Quite a few are college instructors in their areas of academic concentration.

The emphasis in the doctoral program is on broad but thorough grounding in two of the academic areas chosen from history and the social sciences, and specialization in some aspect of professional education.

The program consists of a minimum of 90 semester hours of coursework and dissertation credit beyond the bachelor's degree and exclusive of tool requirements established by the College of Education. These credits are to be distributed among two of the cooperating disciplines—anthropology, economics, geography, history, political science, psychology or sociology—and professional education. Depending upon the background and needs of the candidate, work in the two disciplines chosen will comprise between 60 and 75 percent of the total 90 semester hours, work in education between 25 and 40 percent.

Depending upon the areas of study chosen by the candidate, there will be opportunity for regular class work, small group instruction, internship, independent study, field work and laboratory and computer experience. Seminar and advanced work in courses numbered 200 or above is required in each of the three areas of study.

After most of the coursework has been completed, a qualifying examination of approximately nine hours—normally three hours in each field of study—is required. When the dissertation has been completed, the candidate will defend it orally.

The research problem may be in either of the two academic fields chosen for study, or it may be related to social studies education.

Admission Requirements

Candidates for the doctorate in social studies education must have earned a bachelor's degree in history or one or more of the social sciences at an accredited institution, and a master's degree in history, a social science or education is also required. It is expected that performance on the Graduate Record Examination be satisfactory, and that the academic record of the candidate give promise of scholarly success.

Special Facilities

Students in social studies education have access to the faculties and facilities of the cooperating departments and the College of Education. Special agencies and services are also available, such as the University Hospital School, the Iowa Center for Education in Politics, the Bureau of Educational Research, the Institute of Public Affairs, the Iowa Educational Information Center, the Curriculum Laboratory, the Statistical Laboratory, the Reading Clinic, the Computer Center, and other facilities.

The faculty members who serve as social studies education advisers and coordinators are experienced classroom teachers whose advanced degrees have been earned in history, the social sciences and education. They are active in professional organizations, consultative work and in working with schools in curricular revision.

Courses

Coursework undertaken for social studies education degrees consists largely of offerings in cooperating disciplines —anthropology, economics, geography, history, political science, psychology and sociology—and the College of Education. However, candidates for advanced degrees must complete one or both of these courses in social studies education:

98:201 Individual Instruction in Social Studies Education **1-2 s.h.**
Individualized readings, field studies and individual projects; focus in history and social sciences, or in problems of professional education. May be repeated. Prerequisite: consent of instructor.

98:202 Seminar: Social Studies Education **arr.**
Reading and discussion on significant developments in history, social sciences and social studies education; substantial investigative paper required. Prerequisite: consent of instructor. Same as 7S:277.

Social Work

Director: Ruth A. Brandwein
Associate director: Ralph E. Anderson
Faculty: *professors* Ralph E. Anderson, Thomas H. Walz
professors emeriti Frank Z. Glick, Mildred Snider
adjunct professor Eugene Gauron
associate professors Irl E. Carter, W. Stanley Good, H. Wayne Johnson, Katherine A. Kruse, William M. Theisen
assistant professors Charles M. Abel, B. Eleanor Anstey, Mary L. Boland, John L. Craft, John F. Else, Anne Gero, Dean E. Hackett, Robert A. Jackson, Patricia L. Kelley, Janet J. Laube, Gary R. Lowe, A. Louise Mays, William B. Mooney, Craig R. Mosher, E. Jean Williams
adjunct assistant professors Joseph Cress, Larry Harris, Charles Palmer, Jean Purdy, Herbert Roth, Sharon Scandrett, Shan W. Steinmark, Beverlee Tracy
instructor G. Michael Jacobsen
adjunct instructors Maury Adams, Ernest Kachingwe, Roger Shafer, Jay Sherman, John Stemple
adjunct instructors in social work practicum Rebecca Banks, Doris Bishop, Jerry Bogards, Louise Bracken, Catherine Collison, James Cooney, Paul Danforth, Della Rose Dowler, Ann Dunnigan, Fred Franck, Kristin Fuller, James Goldman, Loren Jansa, Marianne Michaels, Karen Olmstead, Roger Reid, Judith Rinehart, Michael Ryan, Robert Schmit, Alan Schulte, John Wirtz
lecturers Marvin Bryce, Helen Hageboeck
Degrees offered: B.A., M.S.W.

Undergraduate Program

The undergraduate program in Social Work is intended to provide basic preparation for direct entry into social work practice. In the context of a broad liberal arts education, the program focuses on general practice in social work, rather than specialization. It encompasses several groups of student goals—employment in the areas of social service open to persons with the B.A. degree (e.g., aspects of public welfare, family and children's services, health, corrections and certain group-serving organizations); establishment of a base for graduate study, especially in social work; provision of knowledge for use in allied professions; and broad preparation for informed community participation.

The program is accredited by the Council on Social Work Education.

Requirements

Undergraduate students majoring in social work must satisfy the general College of Liberal Arts requirements, excluding the social science core. The following courses are required for the major:

30:1 Introduction to American Politics	4 s.h.
or	
30:100 Understanding Political Research	3 s.h.
31:1 Elementary Psychology	4 s.h.
or	
31:3 General Psychology	4 s.h.
34:1 Introduction to Sociology: Principles	4 s.h.
Any economics course, e.g., 6E:1, 6E:2, 6E:7, 6E:100	2-4 s.h.
42:102 Social Work	4 s.h.
42:141 Social Work Practice	3 s.h.
42:142 Human Behavior in the Social Environment	3 s.h.
42:143 Social Welfare Program and Policy	3 s.h.
42:144 Social Work Research	3 s.h.
42:176 Social Work Processes	2 s.h.
42:193 Field Experience	7-8 s.h.

A minimum of 12 semester hours of coursework is required in one department listed below in group A or B and nine hours in the other two groups. Most students select either sociology or psychology for the 12-hour requirement. One of the social science courses listed above can be applied toward this requirement, if the choice for the 12 hours is in that social science.

A. Social Sciences

Anthropology
Economics

Geography
Political Science
Psychology
Sociology

B. Humanities

American Civilization
English
History
Literature, Science, and Arts
Philosophy
Religion

C. Related Disciplines

Education
Home Economics
Journalism
Nursing
Recreation Education
Urban and Regional Planning

Most students majoring in social work have ample opportunity for electives in social work as well as in other departments. Students may contact the School for a list of recommended electives.

Honors in Social Work

The School of Social Work has an Honors Program leading to a Bachelor of Arts with Honors in Social Work. Students interested in such a program should contact the School of Social Work.

Admission

Admission to the undergraduate program in Social Work requires:

Completion, with at least a C grade, of the introductory course (42:102), which can be taken no earlier than the sophomore year;
At least a 2.25 grade-point average on a 4-point scale; and
Completion of the application process.

For more information, contact the coordinator of the undergraduate program in Social Work.

Graduate Program

The Master of Social Work degree requires at least 52 semester hours of credit in graduate courses approved by the School; of these, at least 28 semester hours must have been earned after admission to the School of Social Work at The University of Iowa. Students who have completed an accredited undergraduate major in social work are eligible to qualify for the degree with 40 semester hours. Application of this 12-credit reduction will be negotiated with the student's adviser.

After satisfying first-semester foundation requirements or their equivalents, students may choose one of the three concentrations described below, or may choose a "generalist" program.

Students who elect a concentration must take 12 semester hours of courses in that concentration, plus a minimum of four hours in each of the other two concentrations.

Students who elect the generalist program must take at least four hours in each of the three concentrations, plus various electives.

Courses in other departments may also be included in concentrations. Concentrations will be modified periodically; applicants should secure a current description of the program.

Personal and Family Services prepares practitioners for direct service to persons, families and small groups. Content includes study of functional and dysfunctional behavior, theory and practice of treatment modalities, theory and research methodology as applicable to direct services, values and ethical questions, and contemporary issues in service delivery.

Organization of Human Services prepares students for administrative positions in social service organizations. Content includes administrative processes, planning, supervision, consultation, and organizational development. Students examine operational processes, the interrelation of organizations in the community, evaluative methods, and alternatives in organizing. Topics include administration, community organization, teaching, supervision, and planning.

Social Development/Alternative Futures focuses on social change processes directed toward a society based on humanistic value assumptions. It explores alternative social policies and socio-economic political systems; it is an interdisciplinary study of personal, small group, and institutional change both domestically and internationally. Topics include appropriate technology, world futures, social planning, community development, and organizational change.

Students normally take one semester of full-time classroom work on the Iowa City campus, followed by three semesters of concurrent practicum and classroom work. An alternative plan is two semesters of full-time coursework followed by a block placement of 6-8 months. Some students remain in the Iowa City-Cedar Rapids area for the entire program, but most students are assigned to either the Des Moines or Davenport centers for the final three semesters. This normally involves relocating, since the centers are respectively 115 and 60 miles away from Iowa City. In addition to the Des Moines and Davenport centers, the School maintains a center in Sioux City. Part-time students may take coursework in these centers. At least one faculty member is resident in each community in which there is a center. Students must maintain at least a 3.0 cumulative grade-point average on a four-point scale, and must have satisfactorily completed all required M.S.W. coursework, including a research requirement.

The M.S.W. program is accredited by the Council on Social Work Education.

Continuing Education

Extension courses are offered in each Educational Center, and other communities as well. Admission to the M.S.W. program is not a requisite for enrolling in extension courses. Enrollment may be limited.

Joint Degree Programs

Twelve credits of the social work program can be applied to a joint degree in either law or urban and regional planning, if admission to those programs is approved through separate application. Joint degree programs with other departments may be explored. The School of Social Work should be advised well in advance of the student's intention to pursue joint degrees.

Special Features

The School provides a physical and social milieu that supports a people-centered approach to professional education. Included is a strong commitment to student participation in School governance.

For students with specialized interests, the School administers a Gerontology Center, a Regional Child Abuse Center, a National Clearinghouse for Home-Based Services to Children, an Institute for Social Development

Studies in Mexico, a well-equipped Research Center and Media Studio and an industrial social welfare project.

Graduate Admission

Applications for full-time study will be accepted beginning September 1. Fifty percent of the admissions will be made by January 1, 85 percent by February 1, and all by July 1. Effort will be made to assure representation in the class of persons from groups under-represented in the field, and from a diversity of social, cultural, and economic groups in American society.

The School offers a special part-time study program leading to the M.S.W. Application may be made to begin this program in any session. A part-time student is one who plans to complete the M.S.W. program in not less than six semesters or more than 12. An individualized program is planned, in cooperation with the student's adviser. The plan must include two full-time semesters (9 semester hours or more).

To qualify for admission, the applicant must meet the general requirements for admission to the Graduate College (see "Graduate College"), and have the approval of the Social Work faculty committee on admissions.

Generally, a grade-point average of 3.0 on a 4.0 scale (based on junior/senior or at least 12 semester hours of graduate-level work) is required. Up to 25 percent of the class may be admitted with a grade-point average of less than 3.0.

A bachelor's degree (B.S. or B.A.) from an accredited college or university is required, with a reasonable distribution of courses in the social sciences and humanities. A personal statement is required from each applicant; it is reviewed and evaluated. Experience in social work or a related field is viewed as documentation of commitment to the field and the applicant is encouraged to include the relevance of the work experience to social work.

At least three references are required, and if the applicant is currently employed in social work or a related field, one or more references should be provided from the applicant's place of employment. One reference should be from a college teacher or adviser.

Courses

Primarily for Undergraduates

42:1 Helping Individuals and Families 3 s.h.
Introduction to relevant factors in counseling persons and families. Skill development at a basic level. Intended for paraprofessionals and others without formal social work training. No prerequisites.

42:102 Social Work 3-4 s.h.
Social welfare as social institution; settings and methodologies of social work practice; profession of social work; development of American social welfare and social work. A minimum of 60 hours of volunteer work required of presocial work majors. Not applicable toward the M.S.W. Prerequisite: sophomore standing or consent of the instructor. Same as 34:102.

42:176 Social Work Processes 2 s.h.
Processes of social treatment used by social workers with individuals, groups and communities; interviewing and advanced communication skills; emphasis upon integration of theory and practice. Prerequisites: 42:102, 42:141 and 42:142. Corequisite 42:193.

42:191 Individual Study arr.
Project related to student's interest, carried out under direction of faculty member, sometimes including group participation. May be repeated.

42:192 Honors in Social Work arr.
Supervised individual research. May be repeated. Prerequisite: admission to Honors Program.

42:193 Field Experience arr.
Supervised experience in selected social welfare agencies and organizations; requires a minimum of 300 hours in agency participation for 8 credits, 450 hours for 12 credits. Prerequisites: 42:102, 42:141, 42:142, and senior standing or consent of instructor. Corequisite: 42:176.

42:194 Senior Seminar 2-3 s.h.
Selected social welfare problems, issues, innovations and trends.

For Graduates and Undergraduates

(Courses with numbers preceded by asterisks are required in the M.S.W. Program.)

42:111 Legal Foundations of Social Welfare 2-3 s.h.
Historical and political background for modern welfare legislation; begins with the English Poor Laws; progress of public response to poverty, needs of the handicapped through colonization; industrialization and bureaucratization of social welfare in the United States; Social Security and federal participation in state programs.

42:112 Human Sexuality 1-3 s.h.
Physiological and psychological aspects of human sexuality; parameters defined by needs of the group. Same as 17:117, 96:112, 7C:112.

42:113 Social Work Practice in Mental Health 2 s.h.
Overview of the historical development of Community Mental Health, emphasizing the CMH Act of 1963; structure of CMH Centers, study of basic and adjunctive services mandated, consideration of alternative delivery systems of service; case study of mental health resources and allocation at a state level; study of concepts and approaches in mental illness and mental health. Prerequisite: 42:102, 42:142.

42:119 Social Work and Discrimination 2 s.h.
Examination of policies and issues related to discrimination against various subgroups within American society, such as social/ethnic minorities, women, elderly, children, physically handicapped, mentally retarded, and homosexuals.

42:121 Social Work Practice in Public Social Services 3 s.h.
Types of services which occur in the public social services — income maintenance, foster care and adoption, protective services and youth services. Prerequisite: 42:102, or graduate standing, or consent of instructor.

42:125 Child Care Centers: Development and Administration 2-3 s.h.
Development of child care centers from historical and cultural perspective; overview of child care centers in the United States; management and operation from a theoretical and practical point of view; particular concern for issues such as parental involvement, community support, financial constraints, different models of child care programming and administration. Prerequisite: permission of instructor.

42:126 Group Processes 2-3 s.h.
Group dynamics, awareness of group process, and other significant variables as they pertain to both task-centered and personal change groups; concepts are related both to membership and to management concerns of the group process. Prerequisites: 42:141 and 42:142, or equivalent.

42:127 Social Work and Racism 2-3 s.h.
Examination of racial/ethnic minority cultures, manifestations of personal and institutional racism, historical basis of racism, methods of opposing racism.

42:129 Alcoholism and the Social Services 2 s.h.
Public and private treatment methods including Alcoholics Anonymous; addiction and the "alcoholic personality," the progressive nature of the disease; the genetic, etiological, physiological, psychological and sociological aspects of the problem; alcoholism and the law and law enforcement; alcoholism among women, teenagers and the family; alcoholism in industry; polydrug involvement; rehabilitation and the vulnerability of the alcoholic to relapse; progressive sobriety.

***42:141 Social Work Practice** 3 s.h.
Scope and responsibility of social work; combines the common conceptual base for all social work practice with experiential skill labs enhancing base interpersonal helping skills; emphasis on maintenance of a simultaneous dual focus of person and environment. Prerequisite: 42:102, graduate standing or consent of instructor.

***42:142 Human Behavior in the Social Environment** 3 s.h.
Survey course designed to introduce the social work student to various theoretical conceptualizations of the levels of human behavior (societal/cultural, community, organization, group, family, and individual); the social systems approach is used as the organization of the course. Prerequisite: 42:102, or graduate standing, or consent of instructor.

***42:143 Social Welfare Program and Policy** 3 s.h.
An examination of social welfare policy development: the historical aspects, value assumption, social-political-economic context, processes and skills required for analysis, and critical analysis of the effectiveness of social welfare programs. Prerequisites: an economics course and 42:102, or graduate standing, or consent of instructor.

***42:144 Social Work Research** 3 s.h.
Selected research skills appropriate to participation in social work research; emphasis on formulating research questions; research design and methodology; sampling techniques; sanctions; data collection, classification, and analysis; presentation of findings and related research techniques and experiences. Prerequisite: 42:102, or graduate standing, or consent of instructor.

42:156 Probable World Futures 3 s.h.
Techniques of social and political forecasting; program-

matic and policy considerations which relate to predictive methods; consideration of value systems as they influence actions and determine future events; special attention to topics such as cross-impact-analysis, Delphi methods and envelope curve predictions.

42:157 Preferred World Futures 3 s.h.
Analysis of types of world futures using scenario techniques; problems of famine, population and world poverty analyzed in terms of their impedance of solutions to world social problems; alternative methods of approach to solutions.

42:181 Constitutional Law and Procedure in Criminal Justice 2 s.h.
Constitutional foundations of criminal justice and the development of the case law, both adult and juvenile; evolution of due process for law enforcement from the investigative stage through ultimate prosecution and appeal; pretrial, trial, and postconviction procedures; issues of probation, incarceration, and parole.

42:182 Social Work Practice in Criminal Justice 2 s.h.
Social work practice in criminal justice, with emphasis on corrections; special attention to how this field differs from most others in social welfare, and to treatment approaches most relevant for working with offenders. Prerequisite: junior standing.

42:183 Issues in Criminal Justice and Corrections 2 s.h.
Analysis of contemporary programs, organizational structures, and administrative processes in criminal justice, particularly corrections, and the social policy issues inherent in these; content varies from term to term to allow for diversity of problems. May be repeated. Prerequisite: 42:102, or graduate standing, or permission of instructor.

42:190 Training Group Processes 2-3 s.h.
Designed to enable students to understand selected group processes, styles of leadership, and their own interpersonal style; students participate in a structured group experience which focuses on groups for personal development, groups as aids for training, and groups for personal behavior change. Same as 7C:190.

42:198 Workshop in Social Work and Social Welfare arr.
Workshops on selected topics regarding the social work profession and fields of social work practice.

42:199 Selected Aspects of Social Work and Social Welfare arr.
Concentrated study of selected topics in the social work/social welfare field. May be repeated.

Primarily for Graduates

(These courses are not available every semester.)

42:200 Integrative Seminar 1 s.h.
Examination of one's values, educational goals and processes, and knowledge within the context of social work education and the social work profession. Two-semester course, 1 credit per semester. Prerequisite: full-time graduate registration.

42:201 Community Organization 2-3 s.h.
Examination of concepts and principles of intervention in communities and formal organizations; the place of community organization within the social work profession; development of skills in analyzing issues and situations and in designing and implementing strategies for change.

42:214 Group Care Services for Children: The Need for Standards and Licensing 3 s.h.
Interdisciplinary seminar to examine historical, legal and protective considerations in standards for out-of-home care, including health, safety, nutrition, development, and educational needs of children. Same as 7E:214, 96:214, 17:214.

42:215 Interdisciplinary Approaches to Serving Vulnerable Children and Their Families 3-4 s.h.
Interdisciplinary seminar focusing on identification of at-risk groups in the population and on prevention, assessment and management of selected situational and developmental crises predicted to interfere with children's development. Prerequisite: permission of one of the instructors. Same as 7E:215, 17:215, 96:215.

42:216 Group Leadership in Human Sexuality 0-3 s.h.
Theoretical issues and research findings, as they relate to individual small-group process and outcomes, with primary emphasis on individual responses to information and experiences associated with serving as group facilitator for Human Sexuality course; required written weekly summaries of group process serve as a starting point for discussions of group dynamics and procedures. Prerequisites: 42:112 and consent of instructor(s).

42:217 Social Services in Industry 2 s.h.
Exploration of characteristics and needs of the work force and selected groups within it: youth, women, and working-class employees; e.g., examination of social services delivery to workers and their families, including counseling for personal or alcohol-related problems.

42:220 Family Law 3 s.h.
Principal legal aspects of family life, including marriage and spousal relationship, rights of children, abuse and neglect, delinquency, juvenile court, custody, dissolution of marriage, adoption, termination of parental rights, school law, family economics, consumer credit, bankruptcy, real estate, settlement of estates.

42:221 Family Welfare 2 s.h.
Social policy and the family; nexus of attitudes, values, policies and programs which bear on the family through the cycle of life; impacts of public policy on the family and consequences, planned and unplanned.

42:222 Social Policy Issues in Health Care 2 s.h.
Analyses of major health issues in our country and abroad; the socio-economic-cultural contexts of them; significance for social work profession.

42:223 Aging and Social Work 3 s.h.
Behavioral characteristics of aging, aging policies and programs, and practice with the elderly client; prevalent theories of aging, mental health dimensions, geriatric considerations, traditional and innovative programs, etc.

42:224 Family and Family Structure 2 s.h.
Perspectives on structures and functions of family; changes in family and implications for social work practice.

42:225 Nosology and Classification 2 s.h.
Survey of various classifications and symptomologies used in psychiatric settings; critique of nosological process and antilabeling readings; diagnostic criteria, etiological factors, and treatment modalities. Seminar course to gain additional knowledge and to share clinical experience.

42:226 Seminar: Theories of Personality 2 s.h.
Freudians, neo-Freudians, humanists, other conceptual frameworks.

42:227 Human Development through the Life Cycle 2 s.h.
Socialization process and development of individual identity; considers major biological, psychological, social, and cultural determinants of normal human growth and behavior.

42:228 Adolescence: Service Approaches 2 s.h.
Theoretical and practical issues involved in providing professional social work services to adolescents, with emphasis on approaches to assessment of functioning and approaches to improving functioning.

42:229 Social Work Practice in the Health Field 2 s.h.
Program structure and policy base of the general field of health, with particular emphasis on the role and function of social work; covers comparative health care policy and practice and energy (future) issues; special emphasis on problems of the ethnic minorities and women in the field of health care.

42:230 Family Therapy 2 s.h.
Overview of several approaches to family therapy, and examination of family dynamics and family structure underlying these approaches. Prerequisite: 42:141, 42:142, or consent of instructor.

42:231 Group Psychotherapy 2 s.h.
Seminar and practicum; seminar focuses on specific issues in group therapy; practicum consists of observing and/or coleading groups, to provide experience based on student's interests, needs, and abilities.

42:232 Marriage Counseling 2 s.h.
An introduction to the theory and practice of marriage counseling. Interweaves three dimensions: presentation by the teacher of pertinent materials, class discussion, and experimental growth-oriented activities.

42:233 School Social Work 2 s.h.
Study of the school as a social institution and the activities of the social work profession therein; examination of selected models of social work practice as well as issues.

42:234 Assessment and Remediation of Children's Problems 2 s.h.
Theoretical and practical issues involved in providing professional social work services to children under 12, with emphasis on approaches to assessment of social, intellectual, and emotional functioning, and on approaches to remediation of problems.

42:240 Human Services Administration 4 s.h.
Selected theories of organization; methods of administering an organization; consideration of values and issues peculiar to human service organizations; personal aspects of administrative styles. Prerequisites: 42:141, 42:142, 42:143 and 42:144.

42:241 Advanced Management Lab 2-4 s.h.
Examination of applied management theories and skills, including organizational and administrative problem analysis, personnel policies, staff development, affirmative action, accountability, collective bargaining, information systems, quality control, and communications. Prerequisite: 42:240.

42:242 Applied Management Seminar 2-3 s.h.
Analysis of practicum administrative experiences by students, faculty, and practitioners; emphasis on students' demonstration of conceptual mastery of organizational and administrative theory and skills. Prerequisites: 42:240 and 42:241.

42:243 Teaching Supervision and Consultation 2-3 s.h.
Role of supervision, teaching, and consultation as a means of professional development in human services; consideration of individual differences of learners. Theories of learning, teaching, and supervision are applied to students' experiences.

42:244 Grants Development 2 s.h.
Development of practical skills of grantwriting, budgeting, evaluating, and funding of a grant proposal; ethics of grant development and the social/political significance of government-centered funding.

42:263 Project in Social Work Research arr.
Participation in research directed by faculty, which may extend over several terms. May be repeated.

***42:266 Advanced Social Work Research** arr.
Continuation of 42:144, which is prerequisite. Application of research skills to specific topics such as needs assessment, program evaluation and policy analysis.

42:270 Social Development 2-3 s.h.
Seeks to develop a social structure based on human equality, individual self-actualization and interdependence; various theories and approaches are considered; personal value systems are examined; long-range social change strategies are developed and critiqued.

42:271 Future and Functions of Social Welfare 1-2 s.h.
Exploration of possible social welfare provisions based on alternative value premises and alternative technologies. Prerequisites: 42:141, 42:142, 42:143, 42:144, or consent of instructor.

42:272 Organizational Change 2 s.h.
Theories of organizational function, dysfunction and development, application to organizational problem situations; techniques for intervening in organizations, particularly those which can lead to humanistic change.

42:273 Social Work and Women's Roles 2 s.h.
Examines influence of women in developing services to immigrants, securing education rights as a social entitlement, in laying groundwork for statewide and national systems of public social services. Special attention devoted to personal liberation of both men and women as a prerequisite for developing an alternative social structure.

42:274 Social Planning 2 s.h.
Theory and practice of social welfare planning; includes ideological issues, planning theories and principles, the politics of the planning process, elements of the planning process, and techniques used by planners.

42:275 Urban Growth in Developing Countries 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Same as 6E:275, 34:275, 44:275, 102:275, 113:275.

42:280 Human Behavior: Selected Aspects arr.
Human development and behavior of individuals, groups and organizations; focus on theoretical approaches to understanding personal and environmental forces which influence patterns of behavior; certain aspects may be elected for special study consistent with students' needs and interests.

42:281 Social Work Practice: Selected Aspects arr.
Will involve practice issues which seem particularly pertinent at a given time, specialized areas of practice not already met by a more basic course in the curriculum. May be repeated.

42:282 Social Welfare Policy: Selected Aspects arr.
Legal, political, economic, sociological, historical, philosophical and psychological aspects of social policy formulation; analysis of social welfare policies to understand role of social work in social policy formulation.

42:291 Individual Study arr.
Project related to student's interest is carried out under direction of faculty member, sometimes including group participation. May be repeated.

***42:292 Practicum Seminar** 1 s.h.
Opportunities for further integration of class and practicum as well as for learning beyond opportunities offered in single practicum setting. May be repeated. Prerequisites: 42:141, 42:142, 42:143, 42:144. Corequisite: 42:293.

***42:293 Practicum in Social Work** arr.
May be repeated. Prerequisites: 42:141, 42:142, 42:143, 42:144.

Sociology

Chair: Ronald L. Akers
Faculty: *professors* Ronald L. Akers, David A. Parton, James L. Price, Lyle W. Shannon, J. Richard Wilmeth
associate professors Carl J. Couch, Jae-On Kim, Frank J. Kohout, Edward J. Lawler, Charles W. Mueller, Hallowell Pope, John R. Stratton, Stephen G. Wieting
assistant professors Marvin D. Krohn, Fred C. Pampel, Toby L. Parcel, Karen A. Polonko, Robert F. Szafran, David G. Wagner
affiliated faculty Harold A. Mulford, Gary L. Theisen
Degrees offered: B.A., B.S., M.A., Ph.D.

Undergraduate Programs

An undergraduate major in sociology provides a liberal arts education and is not specifically career-directed. In terms of career preparation, however, completion of baccalaureate study in sociology may provide a desirable background for employment which does not require advanced degree work, such as social science teaching in secondary schools; for graduate study leading to employment in related fields such as social work; or for graduate study preparatory to college or university teaching and research in sociology.

Undergraduate students majoring in sociology should plan their programs in joint consultation with a sociology adviser and an adviser from the intended career field.

In addition to its major programs, the Department provides supportive coursework of value to undergraduate students in a number of fields, particularly other social sciences, business administration, elementary education and nursing.

An undergraduate student majoring in sociology may elect either a Bachelor of Arts or a Bachelor of Science degree program. Students interested in careers in the physical, biological, or social sciences are advised to seek the Bachelor of Science degree.

Both programs require 26 semester hours of coursework in sociology, including 34:1 Introduction to Sociology: Principles; 34:2 Introduction to Sociology: Problems; 34:10-11 Theory, Research, and Statistics; and 12 hours of electives. The two-semester theory, research, and statistics sequence should be taken early, to maximize the student's capacity to benefit from the other sociology courses.

The Bachelor of Science program also requires either 34:12 Logic of Social Science, 26:103 Introduction to Logic, or 26:104 Introduction to Philosophy of Science; a two-course sequence in mathematics; and 22S:25 Elementary Probability and Statistics. To satisfy the mathematics requirement, the student may take 22M:10 Fundamentals of College Mathematics I and 22M:11 Fundamentals of College Mathematics II or 22M:20 Elementary Functions; or complete both 22C:16 Introduction to Programming with PL/1 and 22C:17 Programming with PL/1. Students with exceptionally strong high school mathematics backgrounds may substitute the more advanced 22M:25-26 Calculus I-II sequence for the first mathematics option.

All majors are advised to take at least one basic course in history and philosophy, and six semester hours of coursework in at least one of the following departments: Anthropology, Economics, Geography, Political Science, or Psychology. A list of requirements for a sociology major is available in the Department office.

Sociology Teaching Major

To major in sociology and qualify for a teaching certificate, the students must complete the following requirements:

All departmental requirements for either a B.A. or a B.S. degree;
Two related fields of 12 semester hours each, taken from economics, geography, American history, world history, political science, and/or psychology (20 semester hours required in psychology); and
The professional courses required for certification (23 semester hours).

Sociology courses taken to fulfill the social science core requirements may also be counted toward the sociology teaching major. Other social science or history courses taken to satisfy the social science or historical-cultural core requirements may not be counted toward the hours required in related fields.

Honors in Sociology

Students who wish to graduate with honors in sociology must be admitted to the Honors Program, have a departmental honors adviser, include 34:190 The Development of Modern Social Theory and 34:199 Honors Research in their programs, and take an oral examination upon completion of their honors research.

Graduate Programs

The graduate program trains sociologists for professional careers. It has a research emphasis and primarily prepares sociologists for teaching and research positions in colleges and universities. All graduate students are required to become competent in general theory and quantitative methods, in addition to specializing in substantive areas. Opportunities for research, using survey, experimental and observational methods, are available in the Department.

The Department also provides professional training in deviance control. Students interested in this type of training enroll in the Master of Arts in Criminal Justice and Corrections program.

Master of Arts

The Master of Arts degree in sociology requires 30 semester hours with thesis or 38 semester hours without thesis. The program without thesis is intended for persons who desire a terminal degree and for whom a wider range of course content in sociology is appropriate.

All candidates for the Master of Arts degree must complete 34:201 History of Sociological Theory, 34:202 Sociological Theory, 34:214 Elementary Statistics and Data Analysis and 34:215 Sampling, Measurement and Observation Techniques, with grades of B or higher.

M.A. in Criminal Justice and Corrections

This program is designed for individuals desiring to prepare for careers in the criminal justice system. It provides the student with training in the social and behavioral sciences, the administration of justice, counseling techniques and administrative procedures. The program is administered by the Department of Sociology and has a strong sociological emphasis. A limited number of students are admitted to the program each year, so a low faculty-student ratio is maintained. Arrangements have been made with local criminal justice agencies so that internship placements are available. This program requires a minimum of 45 semester hours and a research paper for a Master of Arts in Criminal Justice and Corrections.

Joint Program in Sociology and Law

A student may obtain a Master of Arts in sociology and a J.D. by fulfilling the basic requirements of both programs. The College of Law will credit up to 12 hours of graduate work taken after entering the joint program toward the 90 hours required for the J.D., even though those hours are also credited toward an M.A. in sociology. At the discretion of the student's M.A. committee, the Department of Sociology *may* credit up to 12 hours of law toward the M.A. degree. This cross-crediting allows a student to receive the J.D. and the M.A. by taking less coursework than would be necessary if the two degrees were pursued independently. This program is highly individualized and allows the student to explore various aspects of the relationship between law and society.

Doctor of Philosophy

The Doctor of Philosophy degree in sociology requires a minimum of 72 semester hours of graduate-level coursework, including the post-M.A. courses 34:216 Intermediate Statistics and Data Analysis and 34:217 Theory and Research Design; comprehensive examinations; and a dissertation.

All doctoral candidates are examined in the basic tool areas of sociology—theory, history of theory, methodology and statistics. In addition, each is examined over one major and one minor area chosen from among the areas currently represented on the faculty, such as social psychology, deviance criminology, family, social stratification, organizations, theory, methods and statistics.

A detailed statement of regulations for graduate study is available upon request. Prospective doctoral candidates should carefully examine this statement.

Graduate Admission

Admission to graduate study in sociology normally requires a minimum undergraduate grade-point average of 3.0 and a total score of 1100 from the quantitative plus verbal sections of the Graduate Record Examination. In addition to the Graduate College procedures, the applicant completes a departmental application statement and uses its personal reference forms in obtaining three letters of recommendation.

Applications can be submitted at any time, but should be completed two months before the start of the academic session for which admission is requested. The deadline for applying for departmental financial support is March 1.

Admission decisions are based on a composite consideration of prior academic performance, personal reference letters, scores on the Graduate Record Examination and the applicant's statement of reasons for pursuing advanced work in sociology. For admission there is no specific coursework expected as an undergraduate, but a background in the social sciences with some mathematical training is useful. A foreign language is not required for admission and there are no foreign language requirements for either the M.A. or Ph.D. degrees in sociology. Inquiries concerning admission should be directed to Chair, Admissions Committee, Department of Sociology.

Admission to the M.A. program in Criminal Justice and Corrections requires a B.S. or a B.A. degree, a grade-point average of 2.75 and a total score of 1000 from the quantitative plus verbal sections of the Graduate Record Examination. Enrollment in this program is currently limited to five admissions per year. A handout is available at the Department office.

Graduate Financial Aid

The Department of Sociology offers three types of awards to graduate students: teaching assistantships, research assistantships and teaching-research fellowships. Resident tuition is charged to out-of-state students who receive awards. Students who receive assistantships are obligated to work twenty hours each week for faculty members on either teaching or research assignments. The department may also offer tuition scholarships to some students.

Special Facilities

The Department maintains a card punch, two terminals for communicating with the University's main computers (IBM 360/65 and CYBER 70/71), and a terminal for access to one of the University's Hewlett-Packard 2000F educational computers. Also available for faculty and students are the facilities of the Center for Research in Interpersonal Behavior (CRIB), a data archives unit, and the Iowa Urban Community Research Center (IUCRC). The

CRIB facility includes a small-groups laboratory complex with audio- and videotape and interactional process recording equipment, programming equipment, and a shop for constructing apparatus. The data archives house the results of numerous surveys which are available to faculty and students for teaching and research purposes. The IUCRC maintains a research library, data bank and laboratory. Surveys in the data bank are accessible for secondary analysis. (See the "Research Activities" section of this *Catalog.)*

Courses

For Undergraduates Only

Note: All sociology majors are required to take 34:1, 34:2, 34:10 and 34:11; 34:1, 34:2, 34:50 and 34:120 are open to freshmen.

34:1 Introduction to Sociology: Principles 3-4 s.h.
Examination of how individuals are organized into social groups, ranging from intimate groups to bureaucracies, and how these influence individual behavior; nature and interrelationships of basic social institutions such as family, education, religion, economy. May be taken in partial fulfillment of the social science core requirement.

34:2 Introduction to Sociology: Problems 3-4 s.h.
Emergence and distribution of selected social problems; alternative solutions; social problems addressed may include population, inequality, female-male relationships, racism, crime. May be taken in partial fulfillment of the social science core requirement.

34:10 Theory, Research and Statistics 3 s.h.
Introduction to basic scientific concepts; emphasis on theoretical thinking, the statement of researchable propositions and the logic and meaning of proof operant in the research process; general issues associated with designing social research, including problems of sampling and measurement, analysis, presenting research data and interpreting research findings. Prerequisites: 34:1, 34:2 and a declared major in sociology.

34:11 Theory, Research and Statistics 3 s.h.
Continuation of 34:10, which is prerequisite.

34:12 Logic of Social Science 3 s.h.
Exploration of selected topics in contemporary philosophy of social science. Prerequisites: 34:10, 34:11.

34:50 Women in Society 3 s.h.
Analysis of the impact of society on women: selected aspects of interpersonal, structural and institutional perspectives. Prerequisite: introductory sociology or equivalent; or consent of instructor.

34:198 Directed Individual Study arr.
Intended for students who wish to pursue subjects beyond or not available in existing courses. Prior arrangement with supervising instructor is necessary. May be repeated.

34:199 Honors Research 2-4 s.h.
Faculty-supervised special research projects. Prerequisite: consent of instructor (in writing).

Advanced Courses

Social Theory

34:190 The Development of Modern Social Theory 3 s.h.
Concentration on selected works of major 19th-century theorists and several representative contemporary sociologists. Recommended for sociology majors and required for honors majors. Prerequisites: 34:1 and junior or senior standing.

34:191 Theories of Sociology 3 s.h.
Consideration of theoretical orientations used in studying social phenomena (e.g., Marxism, functionalism, interactionism); exploration of issues in the construction, analysis and evaluation of theories (e.g., testability, comprehensiveness). Prerequisite: 34:1 or consent of instructor.

34:201 History of Sociological Theory 3 s.h.
Examination of ideas of major 19th and 20th-century social thinkers, e.g., Marx, Weber, Durkheim, Simmel, Mead. Prerequisite: graduate standing or consent of instructor.

34:202 Sociological Theory 3 s.h.
Contemporary theoretical issues and nature of theory, place of theory in research, strategies of theory construction. Prerequisite: graduate standing or consent of instructor.

34:203 Seminar: Sociological Theory 3 s.h.
Selected problems in sociological theory. May be repeated. Prerequisites: 34:201 and 34:202 or consent of instructor.

34:204 Sociology of Knowledge 3 s.h.
Role of ideas, belief systems and ideologies in social life; specifically, the relationship between ideas and the social context at microsociological and/or macrosociological levels. Prerequisite: consent of instructor.

34:205 Seminar: Contemporary Social Theory 3 s.h.
Comparison and examination of leading contemporary theoretical approaches and systems in light of empirical studies. Prerequisite: consent of instructor.

34:207 Seminar: General Systems Theory 3 s.h.
Survey of literature on general systems theory, stressing applicability to theory and research in behavioral and social sciences; analysis of concepts such as entropy, negentropy, cybernetics, morphogenesis. Prerequisite: graduate standing or consent of instructor.

Statistics and Methods of Research

34:111 Nonparametric Statistics in Social Research 3 s.h.
Techniques not making numerous stringent assumptions about the nature of the population from which data were drawn; emphasis on application to rank-order and classificatory data in small samples. Prerequisite: an introductory statistics course.

34:112 Introduction to Statistics for Social Scientists 3 s.h.
Analysis and interpretation of survey and experimental data; descriptive statistics, including percentage tables, linear correlation and regression, partial correlation, and other measures of association; inferential statistics, including the t-test, chi-square, and one-way analysis of variance.

34:113 Social Simulations and Educational Computing 3 s.h.
Reviews sociological research and teaching uses of simulations of social processes; students develop computer simulations and related modules for use in educational settings. May be repeated. Prerequisite: consent of instructor.

34:214 Elementary Statistics and Data Analysis 3 s.h.
Commonly used measures of statistical association; logic of statistical inference and hypothesis testing; contingency tables and linear regression as techniques of statistical control; electronic data processing. Prerequisite: introductory statistics or consent of instructor.

34:215 Sampling, Measurement and Observation Techniques 3 s.h.
Research designs; sampling designs and techniques; questionnaire construction, interviewing techniques; participant and nonparticipant observation; coding and preparation of data for analysis; measurement techniques, reliability and validity. Prerequisite: 34:214.

34:216 Intermediate Statistics and Data Analysis 3 s.h.
Multivariate statistical techniques associated primarily with the general linear model; emphasis on multiple regression, analysis of variance and covariance and corresponding computer programs. Prerequisite: 34:214, 34:215 or comparable course.

34:217 Theory and Research Design 3 s.h.
Theory building and problem formulation; operationalization and redefinition of theoretical variables; choice of strategic research sites; experimental, quasi-experimental and survey research designs; developing and testing causal models. Prerequisite: 34:216.

34:218 Advanced Statistics and Data Analysis 3 s.h.
May be repeated. Prerequisites: advanced graduate standing and consent of instructor.

34:219 Seminar in Research Methods and Data Analysis 3 s.h.
May be repeated. Prerequisites: advanced graduate standing and consent of instructor.

34:380 Modular Topics in Methods and Statistics arr.
Selected methods and statistics topics not included in required or currently offered courses; modules of varying length and credit. May be repeated. Prerequisites: graduate standing and consent of instructor.

Social Psychology

34:120 Principles of Social Psychology 3 s.h.
Introduction to theory and research in small groups, interpersonal and intergroup processes.

34:121 Sociology of Consumer Behavior 3 s.h.
Social psychological aspects of consumer behavior and structural aspects of the marketplace.

34:122 Sociology of Mental Illness 3 s.h.
Methodology, results and interpretations of studies of the social psychology of mental health and mental illness and of the psychiatric hospital as a social institution. Prerequisite: 34:1 or 34:2 or 34:120, or consent of instructor.

34:123 Mass Communication 3 s.h.
Forms of communication (oral, written and electronic) and how these forms are interrelated with social structure and processes. Prerequisite: 34:120 or consent of instructor.

34:125 Small-Group Analysis 3 s.h.
Analysis of social interaction in groups; group problem-solving; group decision making; leader-subordinate relations and place of small groups in large organizations. Prerequisite: 34:120 or graduate standing and consent of instructor.

34:126 Collective Behavior 3 s.h.
Social unrest: crowd behavior; social movements treated as a form of social change. Prerequisite: 34:120.

34:127 Social Forms and Interaction 3 s.h.
Elementary social forms and processes; special emphasis given to the study of interaction in various social contexts. Prerequisite: 34:120.

34:128 Interpersonal Perception 3 s.h.
Problems of self-presentation and the negotiation of social identities; impression formation from actions and role-related behaviors; assessment of intention, motive and purpose; perceptions of personal causality. Processes of role-taking and role-playing in predicting and evaluating others. Prerequisite: 34:120 or consent of instructor.

34:129 Development and Control of Aggression 3 s.h.
Analysis of the social factors contributing to the development of interpersonal aggression, the circumstances culminating in aggression and the social requirements for reducing aggression. Prerequisite: 31:1 or 34:1 or 34:120.

34:131 Interpersonal Conflict 3 s.h.
Use of social psychological theory and research to analyze bargaining strategies, negotiations and conflict resolution.

34:132 Social Psychology of Alcohol Use and Community Problems 2-3 s.h.
Alcohol use and abuse and community reaction analyzed in terms of the alcoholic process and the recovery process.

34:137 Field Methods in Social Psychology 4 s.h.
Field experiments, quasi-experiments and various natural observation techniques. Open to advanced undergraduate and graduate students. Prerequisite: 34:120 or consent of instructor.

34:220 Contemporary Approaches to Social Psychology 3 s.h.
Review and critical analysis of current theoretical approaches and systems of social psychological analysis. Prerequisites: 34:120 and departmental standing as major (or doctoral minor) in social psychology; other students by consent of instructor.

34:221 Seminar: Selected Topics in Social Psychology 3 s.h.
Selected theoretical and methodological issues. May be repeated. Prerequisites: advanced graduate standing and consent of instructor.

34:228 Research Practicum in Social Psychology 3-6 s.h.
Guided group research on selected topics in social psychology. May be repeated. Prerequisite: consent of instructor.

Deviance and Control

34:140 Criminology 3 s.h.
Nature and causes of crime; the criminal justice process, correctional treatment and crime prevention. Prerequisite: 34:1, 34:2 or 34:120, or consent of instructor.

34:141 Juvenile Delinquency 3 s.h.
Delinquency as an individual and social problem; theories of delinquency causation; law enforcement and the juvenile court; methods of correction and prevention. Prerequisite: 34:1, 34:2 or 34:120; or consent of instructor.

34:145 Sociology of Corrections 3 s.h.
Analytical survey of history, structure and function of the American correctional process. Prerequisite: 34:140 or 34:141 or consent of instructor.

34:146 Deviance and Control 3 s.h.
Basic theories of deviance and analysis of social control settings and mechanisms with emphasis on the relationship between social control efforts and social deviance. Prerequisite: 34:140 or 34:141 or consent of instructor.

34:147 Prevention of Crime and Delinquency: Strategies and Problems 3 s.h.
Analysis of intervention strategies in the areas of crime and delinquency emphasizing problems in theory, method and evaluation of intervention techniques. Prerequisite: 34:140 or 34:141 or consent of instructor.

34:148 Internship in Criminal Justice and Corrections 1-4 s.h.
Supervised fieldwork in a criminal justice or correctional agency with formal instruction in theory and technique. May be repeated. Prerequisites: declared major in sociology; junior or senior status; and 34:140 or 34:141; or consent of instructor.

34:182 Sociology of Law and Criminal Justice 3 s.h.
Formation of law; impact of law in society; structure and operation of the criminal justice system. Prerequisite: 34:140 or 34:141 or consent of instructor.

34:240 Seminar: Criminological Theories 3 s.h.
Theories of crime causation and their relationships to the cultures in which they have functioned. Prerequisites: graduate standing and consent of instructor.

34:242 Seminar: Sociology of Law 3 s.h.
Law as a social institution; its origin, development and relationship to culture; social processes, social groups and other means of social control. Prerequisites: graduate standing and consent of instructor.

34:244 Seminar: Selected Topics in Deviance and Control 3 s.h.
Critical analysis of current research with particular emphasis upon theoretical contributions and methodological foundations. May be repeated. Prerequisites: graduate standing and consent of instructor.

34:247 Seminar: Deviance 3 s.h.
Critical analysis of models of deviance with particular emphasis upon significant theoretical and methodological issues. Prerequisites: graduate standing and consent of instructor.

34:249 Professional Seminar in Criminal Justice 1 s.h.
Integration of coursework and experience through group discussion and individual research. May be repeated. Prerequisite: enrollment in M.A. program in Criminal Justice and Corrections.

Family, Socialization, and Society

34:108 Sociology of Sex Roles: Introduction to Women's Studies 3 s.h.
Designed as a basic social science approach to sex roles and sex role stereotyping, including analysis of both male and female sex roles. Prerequisite: 34:1 or 34:2 or 34:120, or consent of instructor.

34:130 Aging and Society 3 s.h.
Societal age structure; age-status and age-sex roles; correlates of aging; continuities and discontinuities during the life cycle; intergenerational relations; social policy regarding aging and the aged. Prerequisite: 34:1 or 34:2 or 34:120, or consent of instructor.

34:159 The Family in Various Societies 3 s.h.
Family systems in comparative and historical perspective. Comparison of the American family with families in both modern and premodern societies.

34:161 The American Family 3 s.h.
Structure and process; change over the life cycle; interrelations with other institutions; historical changes; variations by social class and ethnic group. Prerequisite: 34:1 or 34:120, or consent of instructor.

34:162 Courtship, Marriage and Alternative Life Styles 3 s.h.
Sex roles and premarital interaction; power, conflict and satisfaction in marriage; the dual-career family; voluntary childlessness; cohabitation; etc. Emphasis on relevant theory and research. Prerequisite: 34:1 or 34:120, or consent of instructor.

34:163 Processes of Socialization 3 s.h.
Examination of general mechanisms and processes of socialization, including adolescent and adult patterns; attention given alternative theoretical explanations of socialization patterns. Prerequisite: 34:1 or consent of instructor.

34:193 Social Development of Children 3 s.h.
Learning and development of interpersonal behaviors from infancy through early adolescence. Prerequisite: 34:1 or 34:120 or 31:1.

34:230 Sociology of the Family 3 s.h.
Review and evaluation of significant research traditions; identification of theoretical problems and data sources. Prerequisite: prior work in a social science or consent of instructor.

34:233 Aging and Human Development 3 s.h.
General overview of age and aging as a social phenomenon; e.g., age stratification, social change, the life course, the aged as a social problem; examination of selected topics and theoretical and methodological issues. Prerequisite: graduate standing in a social science department or consent of instructor.

34:269 Seminar: Selected Topics in Family Sociology 3 s.h.
Selected theoretical and methodological issues. May be repeated. Prerequisites: advanced graduate standing and consent of instructor.

34:280 Social Behavior of Children 3 s.h.
Theory and research on learning and development of interpersonal behaviors from infancy through childhood.

34:281 Seminar: Selected Problems in Social Development 3 s.h.
Selected substantive topics dealing with the social behavior of children and adults. Prerequisite: consent of instructor.

Social Institutions and Social Change

Social institutions is a large area consisting of the following subareas: stratification, political sociology, organizations, intergroup relations, industrial sociology and medical sociology.

34:102 Social Work 3-4 s.h.
Social welfare as a social institution; setting and methodologies of social work practice; profession of social work; historical development of American social welfare and social work. A minimum of 60 hours of volunteer work required of pre-social work majors. Not applicable toward M.S.W. Prerequisite: sophomore standing or consent of instructor. Same as 42:102.

34:151 Sociology of the Third World 3 s.h.
Analysis and measurement of "development/underdevelopment"; ideological perspectives on the third world; the modern world-system; selected issues in the study of social change in Asia, the Mideast, Latin America and Africa. Prerequisite: introductory course in sociology, economics, or anthropology. Same as 113:151.

34:153 Public Opinion 3 s.h.
Role of public opinion in making public policy, formation and change of political attitudes and opinion; political ideology; measurement of public opinion; understanding opinion polls. Same as 30:171.

34:158 Sociology of Medicine 3 s.h.
Introduction to new and expanding field of medical sociology: disease and the sick person, health practices and practitioners, health institutions (the hospital), the cost and organization of health services, medical education. Prerequisite: 34:1 or 34:2 or 34:120, or consent of instructor.

34:160 American Society 3 s.h.
American society in comparative perspective; its structure and integration; approaches to study of large, complex, modern societies; institutional interrelationships, institutions as agencies of social control, institutional disorganization as an effect of social change. Prerequisite: 34:1 or consent of instructor. Same as 45:160.

34:167 Sociology of Religion 3 s.h.
Comparative study of religious beliefs and practices; basis in social organization; social consequences in literate societies. Prerequisite: 34:1 or 34:2 or 34:120, or consent of instructor. Same as 32:158.

34:181 Sociology of Popular Culture 3 s.h.
Analysis of the sociological bases, impact and implications of popular culture; interrelationships of popular culture and major social institutions; popular culture and social change; social bases of taste; cultures and publics. Prerequisite: 34:1 or 34:2, or consent of instructor.

34:183 Sociology of Art 3 s.h.
Form and innovation; the social role of the artist; organization of the arts in industrial society; the arts in the university.

34:252 Seminar: Sociology of Religion 3 s.h.
Background of current sociological theories of religion; critical examination of contemporary conceptual and methodological alternatives for the study of religious phenomena.

34:256 Education and Social Change arr.
Focus on the role of educational institutions in connection with political and economic structures in the process of social change; illumination of theories of social change through case studies of educational systems in both the less developed and the industrialized nations. Same as 7F:210.

34:262 Seminar: Medical Sociology 3 s.h.
Theory and research on health institutions in modern society; social etiology of disease, sociological components in treatment, hospital organization and medical practice, sociology of medical education. Prerequisites: graduate standing and consent of instructor.

34:395 Seminar: Communication and Change 2-4 s.h.
Theory, research, and methodological problems of studying change; topics covered include diffusion, innovations, media and change, reform organizations, revolutionary organizations and evolutionary organizations. Same as 19:395.

Community and Population

34:170 Population and Society 3 s.h.
Factors and processes determining population size, composition and distribution; relations of population to social organization and human welfare; recent trends in population with resulting problems, policies and programs. Prerequisite: 34:1 or 34:120, or consent of instructor.

34:172 Social Dynamics of Urban Life 3 s.h.
History of urban growth; concepts and measurement in urban sociology; the Chicago school; urban growth and social change; comparative urban studies; third world cities; the urban ghetto in the U.S.; and myth and reality of suburbia. Prerequisite: 34:1.

34:174 World Population Problems 3 s.h.
World population trends and pressures; their causes and consequences by countries and world areas; cultural contrasts in migration patterns and family planning. Prerequisite: 34:1 or 34:2 or 34:120, or consent of instructor.

34:175 Introduction to Demography 3 s.h.
Principles of and techniques for understanding the demographic characteristics of naturally occurring human populations; emphasis on both temporal and spatial demography. Prerequisite: 34:1 or 34:2 or 34:120, or consent of instructor.

34:179 Problems of Community Organization 2-3 s.h.
Formal organizations, informal groups, voluntary associations and their relation to total pattern of community life. Prerequisite: 34:1.

34:273 Seminar: Community Research 3 s.h.
Development of frame of reference and design for a community study relevant to project plans of the Iowa Urban Community Research Center. Prerequisite: consent of instructor.

34:275 Urban Growth in Developing Countries 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Prerequisite: graduate standing in a social science. Same as 113:275, 6E:275, 44:275, 42:275, 102:275.

34:279 Seminar: Urbanization arr.
Problems growing out of the increase in urban population and the relative decline in rural population; emphasis on Iowa and the Middle West. Prerequisites: graduate standing and consent of instructor. Same as 7D:301, 30:324.

Stratification and Organizations

34:150 Political Sociology 3 s.h.
Sociological analysis of political behavior and belief, group conflict and political process, group consensus, political institutions, power and policy-making systems; relationship of the political system to the social system. Prerequisite: 34:1.

34:154 Education, Race and Ethnicity arr.
Exploration of the role of education in ethnic and racial stratification in the U.S. and other nations; investigation of the influence of variations in family structure, socialization patterns and institutional constraints in the formation of educational aspirations and achievement levels. Same as 7F:154.

34:155 Race and Ethnic Relations 3 s.h.
Multidisciplinary study of intergroup relations with special emphasis given to historical, sociological, and social psychological issues in the study of American minority groups. Prerequisite: 34:1 or 113:3. Same as 113:155.

34:156 Educational Sociology 2-3 s.h.
Designed to provide a macro-sociological perspective on the role of education in social systems. Exploration of the impact of formal education on social stratification, social mobility and economic achievement in the U.S. and select countries. Same as 7F:130.

34:157 Micro-Sociology of Education arr.
Analysis of social-psychological aspects of classroom socialization, interactions, and the determinants of educational aspirations and achievement; emphasis on noncognitive outcomes of formal schooling. Same as 7F:157.

34:164 Organizations 3 s.h.
Approaches to the sociological study of economic and noneconomic organizations; the role of power and authority within the organization and between the organization and its environment. Prerequisite: 34:1 or 34:2 or 34:120, or consent of instructor.

34:165 Occupations and Professions 3 s.h.
Work commitment; prestige of occupations; occupational and professional careers; occupational groups and organizations; alienation; females, minorities, and occupational structures; capitalism and occupations. Prerequisites: 34:1 or 34:2 or 34:120 or consent of instructor.

34:166 Social Inequality 3 s.h.
Major theoretical perspectives for understanding economic, power and prestige inequality; the magnitude of social inequality in the United States; sex and race inequality; trends in and causes of social mobility; selected consequences of social inequality. Prerequisite: 34:1 or 34:2 or 34:120.

34:250 Seminar: Political Sociology 3 s.h.
Selected topics in political sociology.

34:253 Social Stratification 3 s.h.
Classical and contemporary theories of stratification; current research on the causes and magnitude of inequality on the economic, power and prestige dimensions; social mobility; critical issues in stratification. Prerequisite: graduate standing.

34:254 Methods of Social Stratification Research 3 s.h.
Methodological techniques and issues in the study of social stratification. Prerequisite: 34:253 or consent of instructor.

34:255 Seminar: Social Stratification 3 s.h.
Selected theoretical and substantive issues in social stratification. Prerequisite: 34:253 or consent of instructor.

34:268 Seminar: Occupational Structure and Social Mobility 3 s.h.
Conceptualization of and measurement of social mobility; cross-cultural comparisons and trends in mobility; current research on U.S. mobility with emphasis on race and sex differences.

34:284 Seminar: Organizations 3 s.h.
Exploration of selected problems in organizational theory.

Prerequisite: graduate standing or consent of instructor.

34:285 Complex Organizations 3 s.h.
Introduction for graduate students to the study of organizations; major topics: productivity, effectiveness, innovation, coordination, conformity and satisfaction. Prerequisite: graduate standing or consent of instructor.

34:286 Methods of Organizational Research 3 s.h.
Selected topics in methods of organizational research. Prerequisite: graduate standing or consent of instructor.

Independent Reading and Research Projects

34:382 Practicum on Undergraduate Teaching 3 s.h.
Supervised preparation for teaching an introductory-level sociology course. Discussion of alternative course materials and teaching techniques; preparation of course syllabus, exams, lectures, etc. Practice lectures. Videotape equipment available. Prerequisite: consent of instructor.

34:383 Readings and Research Tutorial arr.
May be repeated. Consent of supervising faculty member required.

34:385 Master's Thesis arr.

34:386 Ph.D. Dissertation arr.

Spanish and Portuguese

Department chair: George De Mello
Faculty: *professors* Julio Duran-Cerda, Oscar Fernandez, Joseph Szarlics
professors emeriti Edmund de Chasca, E.W. Ringo
associate professors George De Mello, Walter Dobrian, R. Thomas Douglass, Enrique Fernandez-Barroe, Roslyn Frank, Coleman Jeffers
assistant professors Oscar Hahn, Philip Klein, Thomas E. Lewis, Jane McDivitt, Mario Santizo, John T. Webb
instructor Patricia Williams
Degrees offered: B.A. (Spanish or Portuguese), M.A. (Spanish), Ph.D. (Spanish)

The Department provides coursework for undergraduate and graduate majors in Spanish or Portuguese, for the satisfaction of foreign language requirements for baccalaureate and advanced degrees in other fields, and for the satisfaction of the second literature requirement for undergraduate majors in English and in letters.

Knowledge of foreign language and culture is indispensable in many career areas. Students majoring in Spanish or Portuguese may find opportunities in such fields as business, transportation, industry, journalism, international broadcasting, and publishing, as well as teaching, research, library work, and translating.

Undergraduate Programs in Spanish

First- and second-semester Spanish courses interrelate the four performance objectives—understanding, speaking, reading, and writing—through a four-skill format and a policy of frequent testing of these skills. Students thereby acquire a broadly based evaluation of their strengths and weaknesses and can calculate and plot their progress in preparation for future work.

Third- and fourth-semester courses are conducted on a dual-track basis, allowing students to enroll in sections having either an aural-oral orientation or an emphasis on reading, writing, and content analysis.

Major in Spanish

The undergraduate major in Spanish consists of 30 s.h. of required coursework, according to the following program:

Language (12 s.h.)

35:117 Third-Year Language I	4 s.h.
35:118 Third-Year Language II	4 s.h.
35:137 Fourth-Year Language I	4 s.h.

Literature (9 s.h.)

Three of the following (both the Peninsular and the Spanish American areas must be represented):

35:101 Renaissance and Golden Age Literature	3 s.h.
35:102 Modern Spanish Literature	3 s.h.
35:103 Contemporary Spanish American Fiction	3 s.h.
35:104 Spanish American Poetry and Drama	3 s.h.

Civilization (3 s.h.)

One of the following:

35:114 Spanish Civilization	3 s.h.
35:115 Spanish American Civilization	3 s.h.

Electives (6 s.h.)

The remaining six hours may be elected from any course numbered 35:100 or above, except that no more than 2 s.h. may be elected in conversation courses (35:108, 35:135). One course given in English may be taken to satisfy 3 s.h. of this requirement, provided additional readings are done in Spanish.

The undergraduate major program in Spanish described above will be followed by all students declaring a Spanish major after June 1, 1976.

High School Certification

Spanish majors who wish high school teaching certification must complete 35:157 Spanish Phonology I in addition to the requirements listed above. Several courses in the College of Education are also required, as is one semester of Practice Teaching, taken in the senior year.

Transfer Credit

A maximum of 12 semester hours of credit in approved courses may be transferred from other institutions toward the requirements for the major in Spanish.

Honors in Spanish

Admission to the Honors Program in Spanish requires a minimum 3.0 overall grade-point average and a 3.2 average in Spanish. Graduation with honors in Spanish requires six semester hours earned in 35:121-122 Honors Literature and/or 35:123-124 Honors Spanish Language; an Honors essay in Spanish, and an oral examination conducted in Spanish.

Spanish Teaching Minor

The Spanish teaching minor requires 35:117-118 Third-Year Language I-II, 35:137 Fourth-Year Language I, and 35:157 Spanish Phonology I. Students preparing for teaching certification at the secondary level are encouraged to elect additional courses in Hispanic Literature and Civilization.

Undergraduate Programs in Portuguese

First-year Portuguese courses provide training in understanding, speaking, reading, and writing. Second-year courses provide further training in these skills, with emphasis on comprehension and self-expression in Portuguese, through the reading and discussion of current journalistic prose.

Major in Portuguese

The undergraduate major in Portuguese requires these courses, or their equivalents, beyond the second-year level:

Language (8 s.h.)

38:117 Third-Year Language I	4 s.h.
38:118 Third-Year Language II	4 s.h.

Literature (6 s.h.)

38:105 Brazilian Literature I	3 s.h.
38:106 Brazilian Literature II	3 s.h.

Civilization (6 s.h.)

38:115 Brazil: People and Culture	3 s.h.
38:116 Modern Portugal	3 s.h.

Electives (4 s.h.)

38:103 Modern Brazilian Fiction I: Short Story	2 s.h.
38:104 Modern Brazilian Fiction II: Novel	2 s.h.
38:107 Introduction to Portuguese Literature	3 s.h.
38:108 Black Literature of Portuguese Expression	3 s.h.
38:109 Nineteenth-Century Brazilian Novel	3 s.h.

Minor in Portuguese

The undergraduate minor in Portuguese consists of 18 credits in Portuguese, with any combination of courses, including first- and second-year courses.

Offerings for Undergraduate Nonmajors

Undergraduate students in other disciplines may meet part of the College of Liberal Arts literature core requirement with 35:6 Contemporary Latin American Narrative, readings in English. The department offers several other literature and cultural survey courses which are taught in English and are of general interest.

English-language courses in Hispanic literature are crosslisted with those for the major in letters, and further interdepartmental development of this kind is anticipated.

Master of Arts in Spanish

Candidates for the M.A. degree must have completed the equivalent of the undergraduate Spanish major. Deficiencies may be remedied with the appropriate coursework.

Required coursework (38 s.h.)

35:251 Medieval Spanish Literature I	3 s.h.
Golden Age Literature	3 s.h.
35:226 Cervantes—*Don Quixote*	3 s.h.
Modern Spanish Literature	3 s.h.
Spanish American Literature	6 s.h.
35:208-209 Graduate Spanish Language I-II	8 s.h.
35:253 Historical Ibero-Romance Language I	2 s.h.
35:157 Spanish Phonology I	3 s.h.
35:233 Seminar in Teaching	2 s.h.
Electives	5 s.h.

The student is also responsible for the works listed in the departmental reading list.

Maximum Study Loads

Maximum course registration is 15 graduate hours during the fall or spring semesters, and eight graduate hours during the summer session. One-quarter- and one-third-time teaching assistants are permitted to register for the maximum study loads. One-half-time teaching assistants may register for not more than 12 semester hours in the fall or spring semesters, and for not more than six during the summer session. Additional hours may be taken only with Graduate College approval.

Transfer Credit

A maximum of nine semester hours of graduate credit in approved courses may be transferred from other institutions toward the 38-semester-hour requirement for the M.A. degree.

Teaching Certification

Exclusive of the practice-teaching requirement, graduate students may take the courses necessary for secondary teaching certification while completing M.A. requirements in the Department.

M.A. Examinations

Three written examinations and one oral examination will be given. The student chooses from six topics for the written examinations, but must include at least one topic from each of two areas: I. Spanish language and stylistics, Medieval literature, or Golden Age literature; and, II. Modern Spanish literature, Spanish American literature, or Luso-Brazilian literature.

Doctor of Philosophy in Spanish

Two doctoral programs are available.

One is dedicated to Hispanic literatures. Before his or her comprehensive examination the candidate must become well acquainted with another Romance language and literature (a Portuguese-Brazilian program is especially recommended), complete the equivalent of a year of college Latin, and demonstrate a reading knowledge of another approved foreign language.

Qualifying examinations, to be taken during the second semester of residence by all students whose M.A. work was done at other institutions, consist of a two-hour written examination covering two to four literary works, or one major literary work and authoritative criticism of the work(s), as previously determined by the student and the Department; an oral examination; and a research paper prepared at The University of Iowa.

The second doctoral program provides for specialization in Spanish language and literature with emphasis on language. Before his or her comprehensive examination, the candidate must have completed a course in linguistics and the equivalent of three semesters of college Latin, and demonstrated a graduate-level knowledge of a second approved foreign language and a reading knowledge of a third approved foreign language.

In both programs, coursework and individual reading must be designed to give the candidate a thorough knowledge of the Spanish language, its literature, and related civilization, from medieval to modern times; to provide adequate experience in a second Romance language; and to develop the candidate's capacity for critical analysis of literary texts.

The following fields together with the departmental doctoral reading list are considered a basic minimal program for the doctoral degree. The requirement may be fulfilled by acceptable studies at another institution or by the courses at Iowa indicated in parentheses. The requirement may also be met by independent reading and examination. The candidate is encouraged to pursue further studies in these and other areas, in line with his or her particular interests and in order to improve employment opportunities.

Program I: Emphasis on Literature

History of the Spanish Language and Medieval Literature

35:251 Medieval Spanish Literature I	3 s.h.
One additional course in Spanish medieval literature	2 s.h.
35:253 Historical Ibero-Romance Language I	2 s.h.
One additional course in Spanish or Romance Linguistics	2 s.h.

Golden Age Literature

35:225 Drama of the Golden Age	3 s.h.
35:226 Cervantes—*Don Quixote*	3 s.h.

One of the following:
35:227 Fiction of the Golden Age 3 s.h.
35:229 Lyric Poetry of the Golden Age 3 s.h.
35:259 Nonfiction Prose of the Golden Age 3 s.h.
35:262 The Picaresque Novel 3 s.h.

Modern Peninsular Literature

Three of the following (at least one course must be selected in each of the two centuries; a seminar may be substituted for one of the courses, provided the two-century stipulation is met):

35:220 19th Century Spanish Novel 3 s.h.
35:221 19th Century Spanish Poetry and Drama 3 s.h.
35:223 20th Century Spanish Poetry 3 s.h.
35:224 20th Century Spanish Novel 3 s.h.
35:238 20th Century Spanish Essay 3 s.h.
35:241 20th Century Spanish Drama 3 s.h.

Latin American Literature

Four courses (12 s.h.) selected from a minimum of three of the following areas:

Area A

35:271-273 Spanish American Novel of the 20th Century I-III 9 s.h.
35:246 Novel of the Mexican Revolution 3 s.h.

Area B

35:243 Spanish American Colonial Literature 3 s.h.
35:232 Spanish American Essayists and Thinkers 3 s.h.
35:242 Spanish American Literature of the 19th Century 3 s.h.

Area C

35:257 Modernism 3 s.h.
35:244 Spanish American Poetry of the 20th Century 3 s.h.
35:275 Latest Currents in Spanish American Poetry 1950-Present 3 s.h.

Area D

35:231 Spanish American Drama 3 s.h.
35:245 Spanish American Short Story 3 s.h.
35:237 Chilean Short Story 3 s.h.

Area E

A course in Brazilian literature 3 s.h.

Contemporary Language

35:208-209 Graduate Spanish Language I-II 8 s.h.
35:157 Spanish Phonology I 3 s.h.
or phonology component of 35:208

Literary Theory

One of the following:
35:217 Literary Theory and Explication of Texts 2 s.h.
35:284 Types of Modern Criticism 2-3 s.h.

Professional Training

35:211 Research Methods and Bibliography 2 s.h.
35:233 Seminar in Teaching 1 s.h.

Seminars

Two 300-level seminars in literature 4 s.h.

Specialization

Students in Program I desiring to specialize in Medieval literature, Golden Age literature, Modern Spanish literature, Latin American literature, or another approved area may be allowed to substitute courses in that area for one nonrequired course in each of the other areas. However, it is strongly recommended that whenever possible these courses be taken in addition to those in the basic program, as initial employment opportunities are enhanced by having a wide spread in areas of preparation.

Program II: Emphasis on Language

History of the Spanish Language and Medieval Literature

35:251 Medieval Spanish Literature I 3 s.h.
One additional course in Spanish Medieval Literature 2 s.h.
35:253 Historical Ibero-Romance Language I 2 s.h.
One additional course in Spanish or Romance Linguistics, excluding courses listed below.

Comparative Linguistics

35:250 Comparative Romance Linguistics 3 s.h.

Golden Age Literature

35:225 Drama of the Golden Age 3 s.h.
35:226 Cervantes—*Don Quixote* 3 s.h.

Modern Peninsular Literature

One of the following:

35:220 19th Century Spanish Novel 3 s.h.
35:221 19th Century Spanish Poetry and Drama 3 s.h.

One of the following:

35:223 20th Century Spanish Poetry 3 s.h.
35:224 20th Century Spanish Novel 3 s.h.
35:238 20th Century Spanish Essay 3 s.h.
35:241 20th Century Spanish Drama 3 s.h.

Latin American Literature

Three courses from at least two fields listed in Program I

Contemporary Language and Stylistics

35:157 Spanish Phonology I 3 s.h.
Graduate-level phonetics/phonology 2 s.h.
35:208-209 Graduate Spanish Language I-II 8 s.h.
Additional graduate language (excluding seminars below) 2 s.h.

Literary Theory

One of the following:
35:217 Literary Theory and Explication of Texts 2 s.h.
35:284 Types of Modern Criticism 2-3 s.h.

Professional Training

35:211 Research Methods and Bibliography 2 s.h.
35:233 Seminar in Teaching 1 s.h.

Seminars

Two 300-level seminars in language 4 s.h.

Ph.D. Comprehensive Examinations

The doctoral comprehensive examinations assume a general knowledge of Spanish Peninsular and Spanish American literatures and cover three broad fields, such as a literary genre or a historical literary period, chosen by the candidate and representing both of the following groups:

Group I

Spanish Language
Medieval Literature
Golden Age Literature

Group II

Modern Literature of Spain
Spanish-American Literature
Luso-Brazilian Literature

Candidates following the program with emphasis on language take comprehensive examinations in two language fields and one literature field, or, with permission of the Department, in three language fields. The group distinction outlined above does not apply; the literary field, if one is chosen, may be from either group.

The length of time during which the doctoral examinations are taken is determined by the candidate. They may be taken during the course of a semester or limited to a shorter period. Three written four-hour examinations are administered, followed by an oral examination.

Financial Aid

Teaching and research assistantships are available to qualified graduate students. Normally, two years of such support are available for the completion of a master's degree, and four years for the Ph.D. As long as a graduate student's studies and performance meet departmental standards, he or she will continue to receive support over a reasonable period of time, but usually not over four years. A student wishing financial support should apply directly to the departmental office.

Special Facilities

The Language Laboratory provides facilities for language learning, teaching, and research. These include standard and shortwave radios, tape recorders, record players, soundproof recording rooms, two drill rooms with 68 dual-channel tape recorders providing a simultaneous master duplicate and student record, an electronic classroom, a soundproof work room, 16mm and 8mm projection equipment and facilities, and a library of tape and disc recordings. The Department offers to its majors a specific course in language laboratory procedures.

A 30-minute Spanish-language program, "Sucesos en Español" ("Happenings in Spanish"), sponsored by the Department, is broadcast weekly over University radio station WSUI.

The Spanish-Portuguese Players, a group of volunteer student actors, provide dramatic programs in Spanish for students and others in the local area, and on request perform at other campuses in the state.

Spanish Courses

Primarily for Undergraduates

An undergraduate student who has had less than two years of high school study in Spanish will be placed in a first- or second-semester class. If his or her background is two or more years of high school Spanish, he or she will be placed in a third- or fourth-semester class. Prospective and entering students should consult a departmental adviser. Students wishing a more advanced placement may take the placement test. Transfer students who have taken college Spanish at other institutions will be placed according to courses previously completed.

A student may not, except with the approval of the chair, take for credit an elementary course if he or she has already completed a higher-level course for which the elementary course or its equivalent is a prerequisite.

35:1 Elementary Spanish I 3-4 s.h.

35:2 Elementary Spanish II 3-4 s.h.
Prerequisite: 35:1 or equivalent.

35:6 Contemporary Latin American Narrative 4 s.h.
Primary focus on themes and narrative techniques in the major texts of the decade 1960-70; an overview of cultural and socio-political aspects. Given in English; readings in English; for fulfillment of second-semester core literature requirement only. Same as 11:18.

35:8 Spanish for Health Professionals 4 s.h.
Intensive conversation course designed to acquaint students with basic vocabulary used when dealing with Spanish-speaking patients; emphasis on oral-aural proficiency; in addition, students become familiarized with socio-cultural aspects of the Hispanic peoples. May not be taken to satisfy foreign language requirements.

35:11 Intermediate Spanish I 3 s.h.
Prerequisite: 35:2 or equivalent.

35:12 Intermediate Spanish II 3 s.h.
Prerequisite: 35:11 or equivalent.

35:15 Spanish Conversation: Sophomore Level 1-2 s.h.
Discussions in Spanish of daily situations; review of basic syntax and tenses. May be repeated for credit.

35:25 Spanish Pronunciation 1-2 s.h.
Analysis of the sounds of Spanish compared to those of English, with emphasis on improvement of pronunciation through practice. Cannot be taken to complete foreign language requirements. May be taken concurrently with 35:12, 35:117-118.

35:53 Special Work 1-3 s.h.
Written approval of chair required.

35:55 Intensive Elementary Spanish 4 s.h.
A complete first-year course.

For Undergraduates and Graduates

35:100 Readings in Hispanic Literature 3 s.h.
Gradual introduction to literary readings, movements, concepts; reinforcement of language skills through exercises. Given in Spanish. Prerequisite: 35:12 or equivalent.

35:101 Renaissance and Golden Age Literature 3 s.h.
Study and analysis of representative works of the Golden Age of prose, drama and poetry. Prerequisite: 35:12 or equivalent.

35:102 Modern Spanish Literature 3 s.h.
The most important trends of Spanish literature from Romanticism to the generation of 1927. Prerequisite: 35:12 or equivalent.

35:103 Contemporary Spanish American Fiction 3 s.h.
Main 20th-century short-story writers and novelists of Spanish America (Asturias, Borges, Cortázar, Fuentes, García Marquez, etc.) studied through representative works. Prerequisite: 35:12 or equivalent.

35:104 Spanish American Poetry and Drama 3 s.h.
Main Spanish American 20th-century dramatists and poets (Florencio Sanchez, Usigli, Jorge Dias, Ruben Darío, Gabriela Mistral, Pablo Neruda) studied through representative works. Prerequisite: 35:12 or equivalent.

35:107 Spanish American Literature of Fantasy 3 s.h.
Principal manifestations of Spanish American narrative of fantasy from origins in 19th century to culmination in masterpieces of 20th century; analysis based on two modern theories of literature of fantasy, that of Tzvetan Todorov and that of Irene Bessiere. Given in Spanish in alternate years. Same as 108:107.

35:108 Spanish Conversation: Junior Level 1-2 s.h.
Designed to strengthen conversational ability in Spanish, with emphasis on everyday matters and current topics of interest. May be repeated for credit.

35:109 Regents Hispanic Institute arr.

35:112 Contemporary Latin American Novel and Short Story 3-4 s.h.
Survey of contemporary Latin American narrative including works of Borges, Cortázar, Rulfo, and Marquez. Conducted in English; readings in English. Same as 108:112.

35:113 Spanish Theater Workshop 1-3 s.h.
Study of a play(s) which can be produced and interpreted by students in order that they can acquire the fundamental

techniques for translating the dramatic values of a theatrical script to the stage.

35:114 Spanish Civilization 3 s.h.
Political, religious, social, and economic background of Spanish culture; important cultural and literary movements of Spanish history to the 20th century.

35:115 Spanish American Civilization 3 s.h.
Pre-Columbian, Colonial, and Modern periods studied in regard to socio-economic structure, form of government, culture.

35:116 Spanish American Literature and Painting 3 s.h.
Demonstrates the effectiveness of a way of approaching literature; parallel to the analysis of the texts, a survey of the painting of each period will be presented by means of slides.

35:117 Third-Year Language I 4 s.h.
Detailed study of the most important points of Spanish grammar, with emphasis on developing skill in understanding, speaking, and writing Spanish. Prerequisite: 35:12 or equivalent.

35:118 Third-Year Language II 4 s.h.
Designed for Spanish majors and others desiring to increase their language competency. Prerequisite: 35:117 or equivalent.

35:121 Honors Literature 2-3 s.h.
Honors thesis on a literary topic. Open only to Honors students.

35:122 Honors Literature 2-3 s.h.
Honors thesis on a literary topic. Open only to Honors students.

35:123 Honors: Spanish Language 2-3 s.h.
Individual studies in language, at the upper-undergraduate level (beyond 35:137); students are assigned term papers in a Spanish language problem. Open only to Honors students.

35:124 Honors: Spanish Language 2-3 s.h.
Individual studies in language, at the upper-undergraduate level (beyond 35:137); students are assigned term papers in a Spanish language problem. Open only to Honors students.

35:125 Introduction to Bilingualism 2-3 s.h.
"Bilingualism" and "multiglossia" as concepts, particularly as they may relate to learning in school; "limited English-speaking ability" and other legal definitions; processes of contacts of language and their cultural implications; background of individuals and groups as perceived in speaker and listener. Given in English. Same as 103:125.

35:127 Chicano Literature 2-3 s.h.
Introduction to concepts of written and oral literature; review of history and sociology of southwestern U.S., of sources for and expression of literary interests; analysis of standard and nonstandard English and Spanish. Given in English; readings in English. Same as 8:118, 108:127.

35:128 Introduction to Don Quixote 3 s.h.
Analysis of the major work of Cervantes, with emphasis on the historical, philosophical, and literary background of the period. Open to all students regardless of major. Given in Spanish.

35:129 Introduction to Romance Linguistics 2-3 s.h.
Romance languages: what they are and where they fit in the world family of languages; main characteristics of the four more important languages; comparative phonological, morphological, syntactical, and lexical studies; individual projects. Same as 103:129.

35:130 Methods: Foreign Language 3 s.h.
Prerequisite: 35:137 or equivalent. Ordinarily elected as 7S:116. Same as 13:120, 20:119, 9:150, 7S:116.

35:131 Language Laboratory Equipment Procedures 1-2 s.h.
Introduction to and use of language media equipment including tape recorders, video recording, Language Lab consoles and booths, film projectors, introductory language computer programming. Same as 9:151, 7S:124.

35:133 Applied Linguistics 1-3 s.h.
Application of linguistic theory to the teaching of foreign languages, especially Spanish; practical exercises in the production of written, taped, and video materials in foreign language instruction and a study of the theoretical base that underlies them. Same as 103:133.

35:134 Structure of the Spanish Language 2 s.h.
Advanced undergraduate study of Spanish syntax, focusing on Spanish syntactical areas of special interest to English speakers. Prerequisite: 35:137 or equivalent.

35:135 Spanish Conversation: Senior Level 1-2 s.h.
Furthering the student's skill in speaking Spanish; students give oral presentations and prepare class discussions on topics of current interest. May be repeated for credit.

35:136 Language Teaching Practicum 1-3 s.h.
Students teach Spanish to 4th-6th graders at Lincoln and Shimek schools. In addition there is a required teaching seminar. May be taken S/F only. May be repeated for credit.

35:137 Fourth Year Language I 4 s.h.
Stress on syntactic and lexical aspects; aims to build vocabulary and to expand student knowledge of the structure of the language. Prerequisite: 35:116 or equivalent.

35:138 Fourth Year Language II 3-4 s.h.
Stress on syntactic elements of the Spanish language and the theory underlying them; a few areas of syntax are studied in depth. Prerequisite: 35:137 or equivalent.

35:139 Methods of Teaching Spanish 3 s.h.
Theory and practice of teaching foreign languages, especially in secondary school; introduction to teaching resources available to foreign language teachers, micro-teaching experiences, evaluative criteria for testing of teachers and students. Same as 7S:139.

35:140 Introduction to Basque Language and Culture 3 s.h.
Introduction to the culture and language of the Basque people; topics include Basque mythology, matriarchy and indigenous religious cults. Given in English. Readings in English. Open to graduates and undergraduates of sophomore standing and above. Same as 108:114.

35:141 Images of Women in Hispanic Literature 3 s.h.

35:142 Basque Language and Culture II 3 s.h.
Continuation of 35:140; topics will include analysis of both Old and New World Basques. Same as 108:115.

35:145 Chicano Language and Culture for Teachers 3 s.h.
Introduction to use levels, conscious and otherwise, and their intermixture; examination of cultural implications of semantics, syntax, phonology, morphology—in English and Spanish of persons of Mexican and related background. Bibliography provided.

35:146 Early Romance Poetry 3 s.h.
Introduction to form and context of troubadour works, oral tradition, Latin origins and the like in salient poetry of France, Italy, Portugal and Spain; given in English, but read in the original language. Prerequisite: reading ability in a Romance language.

35:154 Intensive Elementary Spanish 0-4 s.h.
Complete first-year course. Open to graduate students.

35:155 Intensive Intermediate Spanish 0-4 s.h.
Complete second-year course. Open to graduate students.

35:157 Spanish Phonology I 2-3 s.h.
Covers articulatory description and phonetic transcription of Spanish sounds, and the processes by which these individual sounds are interrelated into a systematic whole. Prerequisite: 35:118 or equivalent.

35:158 Spanish Phonology II 2-3 s.h.
A more detailed look at some important processes in Spanish phonology and morphology, applying the insights of modern "generativist" methods of linguistic analysis. Prerequisite: 35:157 or equivalent.

35:177 Current Issues, Approaches, and Materials in Foreign Language Education 3 s.h.
Same as 9:152, 7S:154.

35:179 Special Work 1-3 s.h.
Written approval of chair required.

Primarily for Graduates

35:208 Graduate Spanish Language I 4 s.h.
In-depth study of selected topics in Spanish syntax, and an introduction to Spanish phonetics and phonology and modern transformation analyses of Spanish; each student compiles an extensive bibliography on some aspect of Spanish language to serve as the basis for a serious research paper to be completed in 35:209. Prerequisite: 35:137 or equivalent.

35:209 Graduate Spanish Language II 4 s.h.
Theory-oriented study of selected topics of Spanish syntax with practice in application of the theories presented; culmination of the research paper begun in 35:208. Prerequisite: 35:208 or equivalent.

35:210 Studies in Style 3 s.h.
Introduction to literary theory and method; explication of texts.

35:211 Research Methods and Bibliography 2 s.h.
Main bibliographical sources of Spanish literature, culture, and history; methods of literary and historical research.

35:212 Intellectual Backgrounds of Literary Periods 3 s.h.

35:213 Theory of the Novel 3 s.h.

35:214 Advanced Grammar for Teachers 3 s.h.
Problems of syntax, such areas as subjunctive/indicative, relative pronouns, uses of *se*, use and omission of article, *ser/estar*, adjective position, verbal aspect, etc; an attempt will be made to reach the underlying motive signaling the use of one form over another.

35:216 Advanced Spanish Syntax 3 s.h.
In-depth presentation of various aspects of Spanish syntax. Presentation, though highly theoretical, includes ample practice in exercises designed to test the theories presented.

35:217 Literary Theory and Explication of Texts 2-3 s.h.
Introduction to major currents in contemporary literary theory through examination of the way in which these theories construct the literary text. Study of structuralist, semiotic, psychoanalytic, Marxist, and Derridian criticism.

35:219 Advanced Lexicology and Syntax 3 s.h.
Graduate-level study of outstanding problems in the Spanish lexicon and syntax; study of differences between synonymous or similar words and expressions and of syntactical problems.

35:220 19th Century Spanish Novel 3 s.h.
Significant novels, literary schools, and movements of the 19th century.

35:221 19th Century Spanish Poetry and Drama 3 s.h.
Examination of principal playwrights, trends, and literary movements of the 19th century.

35:222 History of Literary Criticism in Spain 3 s.h.
Critical history of the main movements in literary criticism in Spain from Marques de Santillana to Damaso Alonso; representative works in Spanish literary criticism.

35:223 20th Century Spanish Poetry 3 s.h.
Principal poets and their works from 1900 to the present.

35:224 20th Century Spanish Novel 3 s.h.
Principal figures and trends from the generation of 1898 to the present.

35:225 Drama of the Golden Age 3 s.h.
Main dramatists and representative works of Spain's rich drama of the Renaissance; pre-Lope de Vega period through Calderon de la Barca.

35:226 Cervantes's Don Quixote 3 s.h.
Largely devoted to careful reading of Cervantes's *Don Quixote* in the context of the history of narrative literature.

35:227 Fiction of the Golden Age 3 s.h.
Study and analysis of the representative fictional works of the Golden Age from the *Celestina* to the *Novelas Ejemplares* of Cervantes.

35:228 19th Century Spanish Essay 3 s.h.
History of the Spanish essay during the 19th century through representative figures and works.

35:229 Lyric Poetry of the Golden Age 3 s.h.
Study and stylistic analysis of representative poetic texts of the great Renaissance and Baroque poets: Garcilaso de la Vega, Fray Luis de Léon, San Juan de la Cruz, Gongora, Lope de Vega and Quevedo.

35:231 Spanish American Drama 3 s.h.
Study of Spanish American theater from the pre-Columbian era up to, and with an emphasis on, contemporary theater.

35:232 Spanish American Essayists and Thinkers 3 s.h.
Study of the reformers of the 19th century and their efforts to create an independent Spanish American consciousness, and of the outstanding contemporary Spanish American problems.

35:233 Seminar in Teaching 1 s.h.
Discussion of methodology, classroom techniques, testing and evaluation of students in elementary Spanish. For teaching assistants within the Department.

35:237 Chilean Short Story 3 s.h.
Beginnings of the Chilean short story in the 19th century; the realistic short story of the 20th century; surrealism and neorealism; parallelism with the development of the continental short story.

35:238 20th Century Spanish Essay 3 s.h.
Representative essays of the 20th century (from 1898 to the present) including discussions of 20th century philosophic, political and literary movements.

35:241 20th Century Spanish Drama 3 s.h.
Principal playwrights and trends to present day; focus on the works of Benavente, Garcia Lorca, Casona, Buero Vallejo and Sastre.

35:242 Spanish American Literature of the 19th Century 3 s.h.
Beginnings of Spanish American national literatures; the decisive function of Romanticism; the first great era of Spanish American literature and the beginnings of the modern period.

35:243 Spanish American Colonial Literature 3 s.h.
Study of the meeting of two cultures in the 16th century, through the writings of chroniclers and poets; consequences and influences; the Baroque: first literary influence in America.

35:244 Spanish American Poetry of the 20th Century 3 s.h.
Study of the principal works of Spanish American vanguard poets and of the characteristics of their poetry; the following authors are studied: Vicente Huidobro, Cesar Vallejo, Pablo Neruda, Jorge Luis Borges, Octavio Paz and Nicanor Parra.

35:245 Spanish American Short Story 3 s.h.
Beginnings of the short story genre during Romanticism; the Modernistic short story, and the function of Naturalism and Modernism in the 20th century.

35:246 Novel of the Mexican Revolution 3 s.h.
Study of the most representative novels on the Mexican Revolution theme, with reference to the various narrative techniques used in the Spanish American novel.

35:248 Hispanic Prose of Ideas 2-3 s.h.
Centered on the major works of Jose Ortega y Gasset, serves as introduction to his thought and to one of the most influential 20th-century philosophic currents: existential phenomenology or philosophy of life.

35:250 Comparative Romance Linguistics 3 s.h.
Diachronic and synchronic comparison and contrast of the principal Romance tongues and their contacts with each other and their neighbors. Original research expected. Same as 9:250, 20:201, 103:262.

35:251 Medieval Spanish Literature I 2-3 s.h.
Study and analysis of representative works of Medieval literature: *El Poema del Cid*, *El Romancero Viejo*, *Milagros de Nuestra Señora*, *El Conde Lucanor* and *El Libro de Buen Amor*.

35:252 Medieval Spanish Literature II 2-3 s.h.
Studies in 14th- and 15th- century Spanish literature. Prerequisite: 35:251.

35:253 Historical Ibero-Romance Language I 2-3 s.h.
Thorough analysis of main trends and consideration of problematic situations in Castilian, some Portuguese, Catalan, and other Iberian language dialects, with historical and comparative methodology. Same as 103:260.

35:254 Historical Ibero-Romance Language II 2-3 s.h.
Assuming a knowledge of principles of historical and comparative phonology, morphology and some semantics, this course concentrates on syntax, from Latin to Spanish. Same as 103:261.

35:257 Modernism 3 s.h.
European and Spanish American forerunners of Modernism; study of Modernistic poetic motifs in verse and prose; the early modernists; Ruben Dario and the flowering of Modernism; death and transfiguration of the "swan."

35:259 Nonfiction Prose of the Golden Age 3 s.h.
History of the ideas in Spain during the 16th and 17th centuries; cultural movements of the Golden Age; principal essayists and their works.

35:262 The Picaresque Novel 3 s.h.
Study and analysis of the representative picaresque novels (*Lazarillo de Tormes*, *Guzman de Alfarache*, and *El Buscón*) with special emphasis on the theory and evolution of the picaresque genre.

35:270 Medieval Writings 2-3 s.h.
Study and analysis of selected periods and genres of Medieval Spanish literature, such as the *Mester de Clerecía* lyric and ballads; medieval narrative, lyric poetry, etc.

35:271 Spanish American Novel of the 20th Century I 3 s.h.
Period 1900-1935; search for a unique image of America; naturalistic documentation and poetic vision of the reality of America; the "exemplary novels"; other highlights of literary Americanism.

35:272 Spanish American Novel of the 20th Century II 3 s.h.
Period 1935-1963; rejection of the tenets of the preceding realistic school; incorporation of the novel into universal currents; influence of Kafka; study of neorealistic tendencies; influence of Brecht and Lukacs.

35:273 Spanish American Novel of the 20th Century III 3 s.h.
Period following 1962; study of the main currents of nonrealism. Return to Kafkian allegory; disintegration of narrative and of reality; study of all important contemporary developments in the novelistic genre.

35:274 Theory of Poetry 3 s.h.
Linguistically-oriented study of the nature, structure and function of lyric poetry, in accordance with the theories of Jakobson, Kayse, Staiger, Barthes, D. Alonso, Genette, Todorov and C. Bousono. Same as 48:274.

35:275 Latest Currents in Spanish American Poetry 1950-Present 3 s.h.
Development of Spanish American poetry after Octavio Paz; includes Ernesto Cardenal, Carlos German Belli, Enrique Lihn and J.E. Pacheco.

35:277 Thesis arr.

35:279 Special Work arr.
Written approval of chair required.

35:284 Types of Modern Criticism 2-3 s.h.
Systematic introduction to the theory of literature; some questions that define the discipline are stated and analyzed; pertinent concepts of traditional and contemporary criticism are examined and reconstructed.

35:359 Seminar: *El Libro de Buen Amor* 2 s.h.
Close reading and analysis of *El Libro de Buen Amor*, taking into consideration the most important critical studies.

35:360 Seminar: Lope de Vega and the Golden Age 2 s.h.
Intensive study of the dramatic theory and practice of Lope de Vega: themes, structure, style, versification, and how the plays reflect the historical period.

35:361 Seminar: Contemporary Spanish Thinkers 2-3 s.h.
The concept of Spain in contemporary Spanish thought, from Ortega y Gasset to Laín Entralgo.

35:363 Seminar: 19th Century Spanish Poetry 2-3 s.h.
Close textual analysis and discussion of works of Melendez Valdes, Quintana, Rivas, Espronceda, Zorrilla, Becquer, Castro, Campoamor, and Núñez de Arce.

35:364 Seminar: Gongora 2 s.h.
Study and analysis of the three major works of Gongora: *El Polifemo*, *Las Soledades* and *Piramo y Tisbe*.

35:368 Seminar: Spanish-American Theater 2 s.h.

35:372 Seminar: Advanced Problems in Syntax 2 s.h.
Thorough study of one or more topics or areas of Spanish syntax; students present papers in class on several aspects of the problem under study and prepare a term paper on some area of the problem or on an associated field.

35:373 Seminar: Perez Galdos and His Time 2 s.h.
Analysis and discussion of Galdos's major works; reading and discussion of European authors roughly contemporaneous (Dickens, Balzac, Flaubert) who may have influenced Galdos.

35:375 Seminar: The Spanish Romancero 2 s.h.
Close reading and analysis of old and some new Spanish ballads in the light of the traditional theory of Menendez Pidal and the oralist theory of Lord and Perry.

35:376 Seminar: Ortega y Gasset 2 s.h.

35:377 Seminar: 19th Century Spanish Thinkers 2 s.h.
Political thought of the 19th century.

35:378 Seminar: United States Spanish Language 2 s.h.
Popular and learned attitudes and an approach to language; survey of relationships between the Americas and the United States; examination of variants in diachronic and synchronic perspectives.

35:379 Seminar: Gabriel Garcia Marquez and Literary Currents in Latin America 2-3 s.h.
How Garcia Marquez's works, particularly his all-encompassing masterpiece, *Cien anos de soledad*, reflect various literary currents, narrative forms, and literary styles of Latin America.

35:380 Seminar: Spanish Subjunctive 2 s.h.
In-depth study of the indicative/subjunctive contrast in Spanish; principal literature on the subject is studied and discussed; students present several brief papers in class and prepare a course term paper.

35:381 Seminar: Borges 2 s.h.
Development of the Spanish American theater in the 20th century.

35:382 Seminar: Gutierrez-Najera 2 s.h.
Involves background material on *modernismo*, role of Gutierrez-Najera as initiator; study of poetry, short story and essay. Lectures, reports, students' reports and seminar papers.

35:383 Seminar: Research Methods and Bibliography 2 s.h.
Advanced treatment of history, theory and practice of bibliography as related to Hispanic studies; students participate in practical exercises in planning, compilation and evaluation of enumerative and critical bibliographies.

35:384 Seminar: Images of Women in Hispanic Literature 2 s.h.
Introduction to image-making of women (both as writers and as characters) within the context of Hispanic literature; readings include selected works of major women writers. Research paper required.

35:385 Seminar: Miguel Angel Asturias 2 s.h.
Study of Asturias's development as narrator as seen from earlier works to latest, with emphasis on those typical of his production.

35:386 Seminar: Vicente Huidobro 2 s.h.
Analysis of specific poems as a basis for determining the characteristics of Spanish American vanguard poetry initiated by Huidobro.

35:387 Seminar: The Structure of the Literary Work 2 s.h.
The essential nature of literature as an object, in light of ideas presented by Felix Martinez-Bonati in his book *La estructura de la obra literaria*.

Portuguese Courses

38:1 Elementary Portuguese I 4 s.h.

38:2 Elementary Portuguese II 4 s.h.
Prerequisite: 38:1 or equivalent.

38:11 Intermediate Portuguese I 3 s.h.
Prerequisite: 38:2 or equivalent.

38:12 Intermediate Portuguese II 3 s.h.
Prerequisite: 38:11 or equivalent.

38:53 Special Work arr.
Written approval of chair required.

38:100 Intensive Portuguese 0-4 s.h.
Open to graduate students and language majors.

38:103 Modern Brazilian Fiction I: Short Story 2 s.h.
Major trends in the short story and novella since 1930, with emphasis on comparative aspects of style and fictional development, includes works by Joao Guimaraes Rosa, Lygia Fagundes Telles, Osman Lins, Clarice Lispector, Dalton Trevisan, Luis Vilela and Murila Rubiao. Given in Portuguese.

38:104 Modern Brazilian Fiction II: Novel 2 s.h.
Representative novels since 1930, emphasizing comparative aspects of style and fictional development; includes works by Jorge Amado, Cyro dos Anjos, Graciliano Ramos, Clarice Lispector and Erico Verissimo. Given in Portuguese. Prerequisite: 38:105 or 38:106.

38:105 Brazilian Literature I 3 s.h.
Introduction to the literature of Brazil from its beginnings through the close of the 19th century; representative readings from all periods and genres, with special emphasis given to works of major Brazilian authors such as Gonzaga, Alencar, Castro Alves, Martins Pena, Machado de Assis and Cruz e Sousa. Conducted in Portuguese.

38:106 Brazilian Literature II 3 s.h.
Survey of 20th-century Brazilian poetry, novels, short stories and theatre; Modernism, Regionalism, the Generation of '45 and Concretism as well as the works of the principal figures behind these movements; focus on such major writers of the modern period as Lima Barreto, Mario de Andrade, Drummond, Jorge Amado, Cabral de Melo Neto, Nelson Rodrigues, Guimaraes Rosa, and Lispector. Conducted in Portuguese.

38:107 Introduction to Portuguese Literature 3 s.h.
Representative readings to include Portuguese lyric and epic poetry, Renaissance theatre, Romantic and Realist novels, 20th-century Symbolist verse and Neorealist prose; special attention to contemporary writers of postrevolutionary Portugal. Offered every other year. Conducted in Portuguese.

38:108 Black Literature of Portuguese Expression 3 s.h.
Introduction to the literature of black experience from Brazil, Cape Verde, Sao Tome-Principe, Guinea-Bissau, Angola and Mozambique. Same as 45:108, 108:109.

38:109 Nineteenth-Century Brazilian Novel 3 s.h.
Major works of 19th-century Brazilian Romantic and prose fiction, with emphasis on theoretical aspects of the development of the novel in Brazil; includes works by Jose de Alencar, Antonio Manuel de Almeida, Joaquim Manuel de Macedo, Bernado Guimaraes, Taunay, Aluizio Azevedo, every other year. Given in Portuguese. Prerequisite: 38:105.

38:115 Brazil: People and Culture 3 s.h.
Introduction to modern-day Brazil through study of the various ethnic groups which compose its population and through examination of the historical background, the political and economic structures, and the art and literature which form the basis of Brazilian national culture; interdisciplinary course draws on materials in English from the social sciences and the humanities. Same as 45:115.

38:116 Modern Portugal 3 s.h.
Introduction to Portuguese culture and society through study of the history, political and economic structures, art and literature of the Portuguese people; special attention to causes leading to the 1974 Revolution of the Carnations and to its social and cultural impact on present-day Portugal; interdisciplinary course drawing on materials in English from the social sciences and the humanities.

38:117 Third-Year Language I 4 s.h.
Emphasizes the further development of speaking and writing skills; materials for discussion are taken from current Brazilian magazines, short stories and plays; 12 compositions are required. Prerequisite: 38:12 or equivalent.

38:118 Third-Year Language II 4 s.h.
Emphasizes the further development of speaking and writing skills via discussion, grammar and vocabulary review, and composition; weekly compositions. Prerequisite: 38:117 or equivalent.

38:179 Special Work 1-3 s.h.
Written approval of chair required.

38:279 Special Work arr.
Written approval of chair required.

38:370 Seminar: Machado de Assis 2 s.h.
Study of this great Brazilian writer's life and works: poetry, chronicles, theatre, literary criticism, correspondence, and especially his novels and short stories.

38:371 Seminar: Brazilian Theatre 2 s.h.
Brazil's contemporary theatre studies as a dramatic form and in relation to national conditions and world theatre currents; students prepare articles for possible publication. Given in Portuguese.

38:372 Seminar: Da Cunha and Guimaraes Rosa 1 s.h.

Speech and Dramatic Art, Broadcasting and Film

Department chair: Samuel L. Becker
Faculty: *professors* Samuel L. Becker, John W. Bowers, Oscar Brownstein, Cosmo Catalano, Hugh V. Cordier, Douglas Ehninger, Lewin Goff, Richard D. MacCann, Donovan J. Ochs, David Schaal, David Thayer
professors emeriti A. Craig Baird, Donald C. Bryant, Arnold Gillette, H. Clay Harshbarger, Orville Hitchcock, Hugh F. Seabury
associate professors Dudley Andrew, James J. Bradac, Bruce Gronbeck, Margaret Hall, Franklin Miller, John Winnie
assistant professors Robert Kemp, Bruce Levitt, John Lyne, Howard Martin, Jennifer Martin, Judith Milhous, Robert Pepper, Kay Stine, Douglas Trank
instructor Eric Ulfers
adjunct faculty Edward Berkeley, George Klingler, Martha Letterman, James Wockenfuss
Degrees offered: B.A., M.A., M.F.A., Ph.D.

The Department is concerned with communication as a means of personal expression and development; with communication as the major means by which people adjust themselves to their society and their society to themselves; with communication as the essential process for the operation of any society, especially the highly technological society; with artistic as well as functional communication. These concerns with communication are manifested in two ways: faculty attempts and attempts of the Department's students to better understand communication processes, and joint attempts to help improve abilities to communicate effectively, whether as actors or directors, community leaders, supervisors, participants in a group, film-makers, broadcasters, designers, playwrights, teachers, spouses or parents.

The Department has six major divisions, whose emphases and distinctive courses are described below under the headings "Interdivisional Courses," "Speech Education," "Dramatic Art," "Rhetorical Studies," "Communication Research" and "Broadcasting and Film."

General Departmental Requirements

Bachelor of Arts

Regardless of his or her area of specialization, a student seeking a Bachelor of Arts degree in the Department must earn:

A minimum of 24 semester hours in the Department, including at least one course in the dramatic art division, at least one course in the broadcasting and film division and at least one course in the rhetorical studies or communication research division; and
A minimum of eight semester hours of production/performance courses and a minimum of eight semester hours of nonproduction/nonperformance courses in the Department.

A student may specialize in rhetorical studies, dramatic art, broadcasting and film, or speech education. The additional requirements for these majors are cited in the division sections.

Master of Arts

Departmental requirements for the Master of Arts degree are:

A minimum of 30 semester hours, including 36:300 Introduction to Research or its equivalent;
A research thesis or, for the nonthesis degree, a graduate seminar involving significant original research;
Successful completion of a six-hour written examination, the scope of which is determined by the candidate's division and his or her graduate committee; and
At least a 3.0 cumulative GPA for courses on the plan of study.

The application deadline for fall or summer term is February 1 for maximum probability of admission. The minimum cumulative undergraduate GPA required for admission in good standing is 2.75.

Master of Fine Arts in Dramatic Art

See Dramatic Art section.

Educational Specialist (for Junior College Teaching)

Departmental requirements for the Educational Specialist degree are:

A minimum of 60 semester hours, including 36:300 Introduction to Research, a course in the teaching of speech, an approved seminar and at least 19 semester hours completed in the College of Education's graduate program in higher education;
Successful completion of a research report;
A semester's internship in an assigned teaching position;
Satisfactory performance on a nine-hour written examination over areas of learning agreed upon by the student and his or her graduate committee; and
Successful completion of such additional requirements as are specified by the Division of Speech and Dramatic Art in which the student's work is concentrated.

Doctor of Philosophy

Departmental requirements for the Doctor of Philosophy degree are:

A minimum of 72 hours of graduate credit, exclusive of research tools and dissertation;
36:300 Introduction to Research or its equivalent, at least two courses in theory taken within the Department, and others as determined by the student's adviser and graduate committee, in consultation with the student;
Successful completion of a qualifying examination and demonstrated competence in the student's research and major areas of learning;
A substantial scholarly dissertation; and
A 3.0 minimum cumulative GPA for courses on the plan of study.

The application deadline for fall or summer term is February 1 for maximum probability of admission. Admission decisions are based upon a composite consideration of the applicant's undergraduate achievement, letters of reference and other evidence of scholarly potential or achievement. Graduate Record Examination results and samples of one's scholarly work are desirable for the latter purpose.

Interdivisional Courses

36:10 Workshop in Speech and Dramatic Art 2-3 s.h.
Methods of analysis, library research, communication theory, and related forensic areas; practice in voice laboratory, debate, parliamentary procedure, and original oratory.

36:53 Voice Improvement for Speakers and Actors 3 s.h.
Practical introduction to voice and speech for public speakers, teachers, lecturers, broadcasters, and actors; includes study of principles of relaxation, breath control, resonation and projection, and introduction to the phonetics, prosodics and pronunciation of Standard American English.

36:57 Oral Interpretation of Literature 3 s.h.
Introduction to principles and practice of reading literary prose and poetry to audiences; analysis, interpretation, evaluation; recommended for students in elementary education and English.

36:99 Honors in Speech and Dramatic Art arr.

36:149 Problems in Speech and Dramatic Art arr.
Open to seniors and graduate students by permission.

36:151 Readers' Theatre 3 s.h.
Critical analysis and oral presentation of complex works of fiction, nonfiction, poetry and drama; periods and genres of literature studied vary by semester.

36:152 Oral Performance of Biblical Literature 3 s.h.
Performance-oriented approach to the various literary forms in the Biblical anthology; attention to the development of analytic, vocal, and sensory techniques, and to the discovery of imaginative staging concepts from the text.

36:300 Introduction to Research 1 s.h.
Required of all new graduate students in Speech and Dramatic Art except those enrolled for degree of Master of Fine Arts; problems of selecting and developing research problems; study and application of representative methods and techniques of research; lectures, discussions, readings, papers and reports; guidance in research.

36:385 Master's Thesis arr.

36:685 Ph.D. Dissertation arr.

Speech Education

Professor in charge: Douglas Trank
Degrees offered: B.A., M.A., M.A.T.

The speech teaching major requires a minimum of 33 semester hours in the Department of Speech and Dramatic Art. The program must be planned with and approved by a Speech Education adviser. The following should be included:

36:53 Voice Improvement for Speakers and Actors	3 s.h.
36:57 Oral Interpretation of Literature	3 s.h.
36:107 Directing Speech Activities	3 s.h.
Two courses from the Dramatic Art Division	6 s.h.
Two courses from the Broadcasting and Film Division	6 s.h.
Two courses from Rhetorical Studies Division	6 s.h.
Nonproduction or nonperformance courses	6 s.h.

In addition to the secondary education T.E.P. foundations courses, students seeking teacher certification in speech and dramatic art must also register for:

7S:160 Methods: Speech 3 s.h.
or
36:160 Methods: Speech 3 s.h.

7S:191-192 Observation and Lab Practice in the Secondary School 12 s.h.
7S:187 Seminar: Curriculum and Student Teaching 1-3 s.h.

Majors and minors are advised to complete the historical-cultural core requirement with 11:51-52 Drama in Western Culture and their social science core requirement with 103:11 Language and Society and 30:1 Introduction to American Politics. Majors are strongly advised to complete a minor certification in English or other tangential field to strengthen both their major and employment opportunities, and to accumulate a record of achievement in University forensic, broadcasting and film, readers' theater and theater activities.

Minor Certification in Speech and Dramatic Art

Completion of 20 semester hours in speech and dramatic art is required. These hours must include speech methods and a distribution of at least two courses in any two of the following three areas:

(1) public communication (communication theory, interpersonal communication, argumentation, discussion and public speaking courses);
(2) theater and dramatic art (acting, stagecraft, technical theater and oral interpretation);
(3) broadcasting and film.

Courses

36:107 Directing Speech Activities 3 s.h.
Planning, organizing and evaluating curricular and cocurricular forensic and drama programs at the secondary level. Course will cover the establishment of cocurricular speech programs, running and directing contest plays, preparing students for competitive speech and drama activities, and justifying cocurricular programs in the secondary schools. Same as 7S:102.

36:160 Methods: Speech 3 s.h.
Teaching speech, dramatics and forensics; consideration of various patterns in teaching, curricular programs, objectives, instructional methods and materials, effects of oral and written criticism and evaluation, testing and grading, textbooks and references, periodicals and sources of publications, practices and values of extraclass and interscholastic activities, audio-visual aids, facilities and equipment, and other means of upgrading teaching of speech in schools. Same as 7S:160.

36:178 Workshop in Teaching Dramatics, Forensics and Speech arr.
Methods, materials, audio-visual aids, progression and evaluation in teaching, and supervising students in courses and extraclass activities; opportunities for observations, demonstration and practice in teaching voice and speech development, dramatic art, discussion and debate, radio and television, and individual speech, dramatic and forensic events. Same as 7S:178.

36:179 Workshop in Group Oral Interpretation arr.
Theory and practice of various approaches to readers' theater. One week. Same as 7S:179.

36:180 Workshop in Teaching Mass Communication and Media in the Secondary Schools arr.
Study of nonprint media, with emphasis on film criticism; production of radio and film programs. Two weeks. Same as 7S:180.

36:181 Workshop in Interpersonal Communication arr.
Designed especially for the public school teacher who is interested in incorporating new concepts of nonverbal communication, interpersonal communication and human relationship study into the classroom situation. Two weeks. Same as 7S:181.

36:182 Workshop in Creative Dramatics arr.
Uses of creative dramatics for K-8 pupils; approaches to criticism of children's literature. One week. Same as 7S:182.

36:183 Workshop in Teaching the Basic Course in Public Communication arr.
Students examine recent texts and materials appropriate for the first course in communication and develop strategies for the organization and teaching of the course. Same as 7S:183.

36:250 Colloquium: Teaching Freshman Rhetoric arr.
Exploration of literature and problems involved in teaching composition, public speaking and reading. Same as 8P:450.

36:301 Current Issues, Approaches and Materials in Speech and Dramatic Art Education 2-4 s.h.
Development, comparison, and evaluation of student-centered learning activities, teacher-centered learning and teaching strategies, and various classroom and teaching approaches; students expected to develop personal philosophies of speech education and explore contemporary issues in secondary teaching.

36:302 Contemporary Communication Education 2-4 s.h.
Designed to increase teaching competence of college instructors; basic learning theories and student competencies explored; students devise college-level curriculum and suitable tools for teacher and student evaluation; emphasis on the "basic course" in speech; students pursue a pedagogical research topic of their choice.

Communication Research

Professor in charge: John W. Bowers
Degrees offered: M.A., Ph.D.

The program in communication research leads either to the M.A. or the Ph.D. degree. Programs designed for individual students provide the background for and experience in experimental research on interpersonal communication, group communication and the mass media. Candidates are expected to take work in related social sciences in addition to the general requirements of the Department of Speech and Dramatic Art, and to select appropriate courses from those listed below. In general, Ph.D. candidates in this program must complete the statistics sequence in the Department of Psychology or in the College of Education, and take 26:203 Philosophical Problems of the Social Sciences in the Department of Philosophy. Work in advanced statistics and computer science may be used to fulfill the research tool requirements of this Department. Opportunities for varied research in addition to that required for thesis or dissertation projects are available in the Department's Communication Research Laboratory. Several original studies in preparation for dissertation and later research are required of doctoral candidates.

Courses

36:60 Communication Theory in Everyday Life 3 s.h.
For undergraduates only; examination of several noteworthy positions in communication theory and application of those theories to the solution of day-to-day problems. Same as 122:82.

36:70 Resistance to Persuasion 3 s.h.
For undergraduates only; examination of persuasion as manipulative communication in interpersonal, small-group, media and cultural contexts and application of methods for resistance.

36:105 Introduction to Language and Communication 3 s.h.
Relates theory of language to process of interpersonal communication; informal research projects appropriate to introductory course.

36:135 Communication and Conflict 3 s.h.
Consideration of mutual implications of communication theories; analytic papers required.

36:136 Theory and Practice of Organizational Communication 3 s.h.
Nature and function of communication in organizations; includes information flow and processing, communication networks, role relationships, decision making in formal organizations.

36:137 Sex Roles and Communication 3 s.h.
Analysis of research and theory on sex roles and communication processes, including the function of communication in sex role development.

36:150 Proseminar Linguistics 3 s.h.
Same as 103:150.

36:322 Group Communication: Theory and Research 3 s.h.
Survey of small-group research and theory.

36:323 Research Methods in Communication 3 s.h.
Principles and methods of designing and executing experimental research in communication.

36:324 Communication Research 3 s.h.
Review and analysis of research in communication from a social scientific perspective.

36:326 Acquisition of Communicative Behaviors 3 s.h.
Research and theory on acquisition of functional communicative behaviors, including language behavior; original research may be required.

36:350 Research Practicum arr.
Opportunity for completion of individual research projects begun in other contexts or for original research.

36:630 Seminar: Language Variables 2-4 s.h.
Research problems on pragmatic aspects of language, varying from semester to semester. Same as 103:375.

36:631 Seminar: Problems in Group Communication 2-3 s.h.
Focuses on problem area in small-group research, problem area changing from term to term; original research required.

36:632 Seminar: Communication Research 2-3 s.h.
Focus of seminar changes from term to term; topics include methodological issues and communication and conflict; original research required.

36:633 Seminar: Rhetorical and Communication Theory Construction 2-3 s.h.
Criteria for and original work in devising rhetorical and communication theories.

36:634 Seminar: Interpersonal Communication 3 s.h.
Recent theoretical advances and research in interpersonal communication; topics vary but may include social penetration, self-disclosure, and initial interaction.

36:635 Seminar: Organizational Communication Theory 2-3 s.h.
Same as 19:308.

Rhetorical Studies

Professor in charge: Douglas Ehninger
Degrees offered: B.A., M.A., Ph.D.

Bachelor of Arts

This major is recommended for students preparing for active participation in public affairs, communication careers, or teaching. It is intended to serve as an effective focus for a sound liberal education.

Requirements include at least 24 and no more than 36 semester hours in the Department. The program aims at a reasonable balance between doing and knowing—between courses that emphasize informed and guided improvement in oral performance, and courses devoted to theoretical, critical and historical study of the principles and practice of public address and the interrelations of public address and theater, film, radio, television and other arts of communication. The student concentrating in public address also is expected to complete a substantial number of courses in other departments in the College of Liberal Arts.

Programs for majors include:

36:53 Voice Improvement for Speakers and Actors

One of the following:
36R:30 Communicating in Public
36R:31 Group Communication
36R:32 Interpersonal Communication
36:57 Oral Interpretation of Literature
36:151 Readers' Theatre

One of the following:
36R:124 Theory and Practice of Argument
36R:125 Theory and Practice of Persuasion
36R:126 Interview and Conference Methods

One of the following:
36:60 Communication Theory in Everyday Life
36:70 Resistance to Persuasion
36R:80 Communication and Contemporary Culture
36R:110 Theories of Rhetoric
36R:132 Anglo-American Public Communication: Early Period
36R:133 Anglo-American Public Communication: Later Period
36R:135 Contemporary Public Communication
36R:140 Rhetoric of Human Rights

Selected courses in drama and theater, and in radio-TV-film.

At least 15 semester hours beyond the liberal arts graduation requirements in literature, history, psychology, philosophy, foreign language and/or social science.

Forensics

Through forensics, the rhetorical studies student at Iowa has the opportunity to expand research skills, develop improved listening habits, work on organizational and amplification methods, and use all public speaking skills before audiences outside the classroom. Students may choose to work in debate, oratory, interpretative reading or extemporaneous speaking. Each student will have the opportunity to work with experienced instructors at the University and to receive detailed critiques from teachers of argumentation and public communication throughout the country.

The Master of Arts Program

The program is intended to build a strong foundation for teaching in high schools and junior colleges or for proceeding to the doctorate. The program may include the preparation of a thesis, according to the decision of the student and adviser. The program will include:

36:300 Introduction to Research;
At least 15 hours of courses in rhetoric and public address including a seminar;
At least six hours of courses in other divisions of this or related departments;
A course in the bases of speech (voice and phonetics) or evidence of adequate previous training; and
A comprehensive examination.

The Doctor of Philosophy Program

The program leading to the Ph.D. degree is designed to give the candidate a mature grasp of his or her field of learning and to develop the research competencies essential to a life of productive scholarship.

For basic requirements, see the initial sections of this department's description.

Courses

36R:25 Principles of Speech Communication 2 s.h.
Satisfies speech portion of College of Liberal Arts' general rhetoric requirement. Not open for credit to students who have had or are taking 10:1-10:2, 10:3, 36R:30 or equivalent.

36R:30 Communicating in Public 3 s.h.
Intermediate course in public speaking, presuming previous coursework (10:1-10:2, 10:3, 36R:25 or equivalent) or other experience in basic processes and practices of speechmaking; study and experience in more complex forms of informative, argumentative, and persuasive speaking; analysis and criticism of speaking and speakers; attention to the role of public communication in business and the professions.

36R:31 Group Communication 3 s.h.
Principles and practical application of group problem-solving techniques; leadership and group participation; projects in social decision and action.

36R:32 Interpersonal Communication 3 s.h.
Readings, exercises and projects in dyadic and small-group analysis, involving theory and application of personal perception, interpersonal attraction, message variables, feedback and situational context.

36R:33 Practicum in Debate 1 s.h.
Studies in the theory of interscholastic debate. Lectures, discussions, research projects.

36R:34 Communication and Public Affairs 3 s.h.
Practice in informative and persuasive speaking based on study of current public issues.

36R:75 Parliamentary Procedure 1 s.h.
Rules of order for conduct in meetings of committees, clubs and organizations; opportunity for practice in making and debating motions from floor and in presiding over parliamentary sessions.

36R:80 Communication and Contemporary Culture 3 s.h.
Exploration of the settings in which communication occurs; methods for analyzing genres of discourse; communicative habits in conversational games, social propaganda, and

international confrontation; lectures, discussions, records, films, individual projects. Same as 122:80, 108:80.

36R:90 Rhetoric and Politics 3 s.h.
Analytical study of the rhetoric of political campaigns at the national, state and local levels; discussions with candidates and representatives of the media; readings and papers; opportunity for individual investigations. Offered only in campaign years.

36R:110 Theories of Rhetoric 3 s.h.
Introduction to the nature and scope of rhetoric and rhetorical theory; special topics may be stressed in different years; for undergraduates and for beginning graduate students outside the Division of Rhetorical Studies.

36R:124 Theory and Practice of Argument 3 s.h.
Analysis of public argument as practiced in law, social science, politics and other public arenas, and instruction in the presentation of oral argument; recommended for prospective lawyers, business personnel, debaters and others interested in controversy.

36R:125 Theory and Practice of Persuasion 3 s.h.
Extensive study of principles of persuasion with special attention to recent theory; experience in handling complex problems of persuasion in speeches on significant issues, and analysis of persuasive campaigns.

36R:126 Interview and Conference Methods 2-3 s.h.
Techniques and principles of communication in small groups in business, education, law, the ministry and other professions; consideration of theory and guided practice.

36R:130 Rhetorical Criticism 3 s.h.
Concepts and principles of rhetorical theory applied in analytical-critical examination of speeches and speakers, controversial writings and rhetorical dimensions of literary and non-print discourse; readings, discussions, papers in practical criticism. Same as 108:130.

36R:131 Greek and Roman Public Communication 3 s.h.
Historical and critical study of public oral and written communication from 5th century B.C. to 3rd century A.D.; study of relevant social, philosophical and educational practices of culture in relation to the discourse of each era; reading, reports and discussion on the Sophists, selected Attic orators, Cicero and early church fathers.

36R:132 Anglo-American Public Communication: Early Period 2-4 s.h.
Historical and critical study of British and American public oral and written discourse in legislatures, pulpits, law courts, public gatherings, pamphlets and newspapers—1700-1860.

36R:133 Anglo-American Public Communication: Later Period 2-4 s.h.
Covers the period 1860 through 1960. Continuation of 36R:132, with the addition of radio and television addresses.

36R:135 Contemporary Public Communication 3 s.h.
Critical examination of public communication, 1960 to the present.

36R:138 The Rhetoric of Self Justification 2-3 s.h.
Rhetorical strategies used by persons charged with personal and public shortcomings. Case studies range from Demosthenes through contemporary American politicians.

36R:140 Rhetoric of Human Rights 3 s.h.
Rhetorical strategies used by persons debating the principles—and their application in specific situations—of human rights. Case studies range from the classical period to contemporary national and international issues.

36R:301 Classical Rhetoric 2-4 s.h.
Theories and philosophies of discourse in the ancient world. Same as 8:267.

36R:302 Renaissance and Modern Rhetoric 2-4 s.h.
Theories and philosophies of discourse, 1500-1850. Same as 8:268.

36R:303 Contemporary Rhetoric 2-4 s.h.
Theories and philosophies of discourse, 1930 to the present. Same as 8:269.

36R:304 Theories of Discourse 2-4 s.h.
Critical examination of the major modes of discourse; their characteristics, conditions and relationships.

36R:306 Studies in Political Communication 2-4 s.h.
Analytical and critical examination of political and communication theories and their usefulness in explaining the operation of oral and written political discourse.

36R:601 Seminar: Rhetoric and Public Discourse 2-4 s.h.
Guided investigations of selected theorists and practitioners; subject varies by semester.

36R:602 Seminar: Aristotle 2-4 s.h.
Intensive examination of Aristotle's *Rhetoric* and related treatises; survey of relevant scholarship.

36R:603 Seminar: Argument 2-4 s.h.
Studies in the philosophy of argument, with special attention to the work of recent writers in ethics, logic, epistemology and rhetoric.

36R:604 Seminar: Speech Acts 2-4 s.h.
Studies in the analysis of speech acts, with special attention to the work of Austin and Searle.

36R:605 Seminar: Communication, Culture and the Popular Arts 2-4 s.h.
Examination of ways in which cultural norms and communicative forms shape the popular arts of any given epoch.

36R:606 Seminar: Semiotic Analysis 2-4 s.h.
Examination of major semiotic theorists and the applicability of their concepts to the analysis of communication and communicative artifacts.

Broadcasting and Film

Professors in charge: Dudley Andrew, Robert Pepper
Degrees offered: B.A., M.A., Ph.D.

Bachelor of Arts

This program is intended for the student who seeks an understanding of the broadcast and film media and their relationship to the larger field of the communication arts. The program is offered within the context of a liberal education and is not regarded solely as preparation for a professional career. Students may emphasize either broadcasting or film in their selection of elective courses, but minimum requirements lead all students to exposure to historical and evaluative courses in both broadcasting and film, and to experience in the production of materials for broadcast and film media.

The broadcasting and film major requires a minimum of 24 hours in the Department of Speech and Dramatic Art including at least nine hours of production and at least nine hours of nonproduction courses in the Division of Broadcasting and Film.

Graduate Programs

The Master of Arts degree emphasizes research in critical, theoretical, historical and policy issues relating to broadcasting and film. M.A. candidates in film can emphasize production in a plan of study balancing the artistic and scholarly aspects of the field. The major emphasis of the Ph.D. programs in broadcasting and film is the development of research competence.

Facilities

Production courses in broadcasting are held in the University Television Center and in the studios of University radio station WSUI. The large television studio is equipped with three color cameras, telecine island, production switcher and audio board; all associated audio and lighting equipment; 1/2-inch, 3/4-inch, and 2-inch videotape recording capability. A color portapak and an extensive tape-editing facility are used for courses in which location production is required. There are two audio preparation rooms with both reel-to-reel and cartridge machines. Most of the nearby classrooms are wired for television so that tapes can be shown in history and criticism classes, and an area is set aside where students may study videotapes on their own.

Though students in film production courses sometimes use the television studio as a sound stage, it is assumed that most filming will be done on location. There is a "pool" of equipment available for check-out to students in each course which includes: nine Chinon XL Super-8, six Bell and Howell, one Bolex H-17, one Auricon and four Arriflex 16mm cameras; nine Sony cassettes, two Sony reel-to-reels, and three Nagra battery-operated audio recorders; and two Lowell lighting kits. Each course has its own editing areas; there are eight super-8 and fifteen 16mm stations (ten are equipped for sound editing). There are four Moviola editing machines, two of which are "flatbeds," and a sync-selsyn interlock viewing area.

The University maintains a complete motion picture laboratory and all 16mm processing and printing is done on campus. There is a sync-selsyn program-insert three-channel mixing facility. A Moviola library reader is available for students who may wish to study a particular film in detail.

Courses

36B:25 Mass Media and Mass Society 3 s.h.
Introduction to the history and theory of the mass media of communication, with emphasis on radio, television and the motion picture. Discussion sections and papers provide opportunities to explore some specialized topics in depth. Same as 122:81.

36B:35 Introduction to Broadcasting and Film Production 3 s.h.
For the student with no previous experience; the course is project-oriented with a short video production, two short super-8 films and two audio productions required; emphasis on formative principles and effectiveness of communication. Same as 19:35.

36B:40 Introduction to Film Analysis 3 s.h.
Methods of analyzing various kinds of films, with emphasis on "classic" narrative works from the American and European traditions; methods studies include shot-by-shot breakdown, narrative segmentation, auteur and genre studies. Same as 8:10.

36B:50 American Broadcasting 3 s.h.
Overview of broadcast media as communication forms; lectures and class discussions explore historical development of radio and television; emphasis on programming, industry structure and audience composition.

36B:51 Survey of Film 3 s.h.
Introduction to motion picture history, theory and criticism, including study of relationship of film to other arts; film screenings included.

36B:54 Selected Films 3 s.h.
An introduction to methods of analyzing various kinds of films, including fiction, documentary and experimental. Through frequent short writing assignments, students learn to discuss films, scripts and film criticism. Same as 8:54.

36B:100 Mass Media and Mass Society 3 s.h.
Special section of undergraduate course with same title for graduate students who are not majors in Speech and Dramatic Art.

36B:101 Introduction to Broadcasting and Film 2-3 s.h.
Special section of undergraduate course with same title for graduate students who are not majors in Speech and Dramatic Art.

36B:102 Survey of Film 3 s.h.
Special section of undergraduate course with same title for graduate students who are not majors in Speech and Dramatic Art.

36B:103 Radio Production 3 s.h.
Lecture-laboratory course; emphasis on principles and practices of contemporary radio production and programming. Prerequisite: 36B:35.

36B:104 Radio Workshop 3 s.h.
Independent creative work for students who have completed and demonstrated outstanding talent in prerequisite 36B:103.

36B:105 Film for Television 3 s.h.
Operation and use of the 16mm film camera, editing, lighting, and shooting of short news footage used in the daily operation of local TV stations; designed to serve the needs of broadcasting and journalism majors.

36B:106 American Broadcasting 3 s.h.
Special section of 36B:50 (undergraduate course with same title) for graduate students who are not majors in Speech and Dramatic Art.

36B:109 Communications and Media Message Design 3 s.h.
Effect of selected media on shape, control and reception of messages; media characteristics; media selection; and communication strategies; includes practice in media selection and message construction. Same as 7W:109.

36B:110 Television Production I 3 s.h.
Theoretical and technical aspects of television production; responsibilities of writer-producer, director and other production roles; laboratory practice. Prerequisite: 36B:35.

36B:111 Television Production II 3 s.h.
Preparation and development of television programs; emphasis on experimental formats and approaches to use of camera, sound, music, lighting, staging and graphics in television; wide range of production experiences. Prerequisite: 36B:110.

36B:112 Television Workshop arr.
Independent creative work for students who have completed and demonstrated outstanding talent in prerequisite 36B:114.

36B:114 Film Production I 4 s.h.
Intermediate 16mm production course devoted to film structure and technique; cameras, editing equipment and necessary stock provided for exercises and final project. Prerequisites: 36B:35 and consent of instructor.

36B:115 Film Production II 4 s.h.
Advanced production practices, sync sound editing, camera and recording techniques; class discussion of student work; emphasis on theoretical and aesthetic aspects. Prerequisites: 36B:121 and consent of instructor.

36B:116 Film Workshop arr.
Independent creative work for students who have shown outstanding talent in 36B:115. Prerequisite: consent of instructor.

36B:118 Producing Drama for the Screen 3 s.h.
For advanced production students, actors, and writers interested in aesthetic, technical and organizational problems associated with dramatic and screen production; single-camera videotaping on location with extensive postproduction; entire group is responsible for producing two 20-minute projects.

36B:119 Practicum in Broadcasting and Film arr.
Internship experience working in professional media organizations. Available on pass-fail basis only. Consent of instructor required.

36B:121 New Directions in Video 3 s.h.

36B:125 Teaching Broadcasting and Mass Media 2-3 s.h.
Planning, organizing and evaluating curricula for mass media studies in secondary schools and/or an examination of philosophies and trends in mass communication studies in higher education; students develop a course or curriculum geared to their needs.

36B:126 Technology of Film Production 3 s.h.
A lecture/demonstration course on the technical base (optics, chemistry, film stocks, camera design, sound recording, editing and lab practices) of film production.

36B:127 Television in Society 3 s.h.
The role of the media in affecting social, cultural and political values; factors which determine form and function of programs; in-class screenings of representative television programs.

36B:128 Broadcasting and Film Writing 3 s.h.
Exercises in visualization, sequencing, and dialogue; preparation of treatment and screenplay for a theatrical or television fiction film; tutorial and small group discussions of script problems. Class membership limited. May be repeated. Prerequisites: courses in broadcasting and film study or production and advanced work in writing.

36B:129 The Criticism of Broadcasting 3 s.h.
Study of broadcast media from perspective of critic; examination of major theoretical issues and production elements as they might affect broadcast programming.

36B:130 History of Broadcasting 3 s.h.
Historical overview of broadcast media; course directed toward understanding impact and perspective on 20th-century America provided by radio and television broadcasting.

36B:131 Regulation of Broadcasting 3 s.h.
Study of legal and extralegal systems which regulate content and business practices of broadcast media in United States; emphasis on FCC policies and landmark court cases.

36B:132 Contemporary Issues in Broadcasting 2-3 s.h.
Study of major issues before Congress, courts and FCC which affect broadcasting; focus varies each term.

36B:133 International & Satellite Communications 3 s.h.
Theory, research and analysis of the functions of the mass media in a society, and their effects. Discussion of major philosophical issues involving the uses and control of the media.

36B:134 Film and Public Policy 3 s.h.
Preparation of proposals for public policy based on historical research into problems of official and unofficial censorship, government investigations of violence and obscenity, government sponsorship and production of films, and subsidy for television film and other arts.

36B:135 Broadband Communications 3 s.h.
Examination of the development of cable communications in the United States with an emphasis on recent policy issues affecting the development of cable television.

36B:136 Documentary and Public Issues Broadcasting 3 s.h.
Forms and functions of documentary in print, photography, radio, motion picture and television; emphasis on historical development of documentary television form and its use in sociopolitical persuasion in our society; regular screening of programs from important television series.

36B:137 Broadcasting and Education 3 s.h.
Overview of the development and current status of broadcasting in education. Examination of research and evaluation of performance in production, promotion and utilization of radio and television in formal instruction and general education.

36B:138 Comparative Systems of Broadcasting 3 s.h.
A study of broadcasting systems in various countries, their history and development, with an emphasis on the regulatory systems and programming structures of each.

36B:139 Public Broadcasting 3 s.h.
Investigation of the role, organization and problems of nonprofit broadcasting by television and radio, especially since its recognition by federal legislation as an alternate program service to commercial broadcasting in the United States.

36B:140 Broadcast Management 3 s.h.
An examination of management practices in radio and television operations, including staffing, budgeting, audience research, programming, promotion, sales, labor relations, government regulation and community responsibility.

36B:141 Documentary Film 3 s.h.
Historical and critical survey of documentary as reportorial, experiential and persuasive form; screenings emphasize work of Flaherty, Grierson, Lorentz and recent *cinema verité* directors.

36B:142 Film and Ideology 3 s.h.
Study of films and theories illuminating relationship between producers of images, consumers of images and structure of images; often focuses on particular types of films: those about women or violence or politics, for instance.

36B:145 The American Film 3 s.h.
Directors and films which have shaped an image of America; emphasis on Griffith, Chaplin, Keaton, Vidor, Lubitsch, Ford, Welles, Hitchcock, Capra; the gangster film,

western, problem film; the production environment, including actors, executives, and writers, in studio and independent systems.

36B:146 European Film History 3 s.h.
Movements in Europe most significant in film history; silent cinemas of Sweden, Germany and Russia; films of France in the 30s; postwar Italian cinema.

36B:147 French Cinema 3 s.h.
The history of film in French culture. Lectures on French culture, analysis of films and discussion of relation of filmmakers to politics, religion, etc. Same as 9:147.

36B:148 National Cinema 3 s.h.
Focus changes; the history of the cinema and its relation to the culture of either England, Italy, Japan, Germany or Russia.

36B:149 Film Criticism 3 s.h.
Study of the purposes, presuppositions and styles of film criticism; major theoretical positions related to various areas of concern to film critics; theoretical dimensions reflected in writings of students in the course.

36B:150 Film Theory 3 s.h.
Introduction to major theoretical positions; Gombrich and Arnheim vs. Kracauer; Eisenstein and Pudovkin vs. Bazin; structuralism vs. phenomenology.

36B:155 Literature and the Film 3 s.h.
Same as 8:173, 106:173.

36B:156 Drama and Related Art Forms 3 s.h.
Same as 8:171.

36B:157 Film and Art Movements 3 s.h.
A tracing of the growth of the "experimental" film within the context of twentieth-century art movements; film viewings will concentrate on representatives of the impressionist, surrealist, futurist, New American Cinema, lyrical, expanded cinema and structural modes of filmmaking. Student research project.

36B:158 Narrative and Related Art Forms 3 s.h.
Same as 8:172, 106:191.

36B:160 Film Styles and Genres 3 s.h.
This course examines films in terms of various groupings: genre (e.g., the western), style (e.g., the New Wave) and authorship (e.g., Hitchcock); topic will differ from semester to semester. May be taken for credit more than once.

36B:165 Research Methods in Mass Communication 3 s.h.
Different approaches to understanding mass communication processes, with emphasis on nonlaboratory studies of audiences. Practical experience in such studies. Focus varies.

36B:311 Influences on Film Production 2-3 s.h.
Focus changes; emphasis on the study of the process of film production from the point of view of the organization of the industry, the growing technology, the patterns of distribution; individual research projects.

36B:326 Social Impact of Mass Communication 3 s.h.
Current theories and research on the functions and impact of mass communication for individuals and societies; discussion of potentially fruitful directions for research.

36B:327 Mass Communication Processes and Effects 3 s.h.
Examination of research and theory which help to explain the processes by which information gets into our environment and into us; creation of the "world in our heads" and the functions and effects of that created world.

36B:600 Seminar: American Film and American Culture arr.
Study of a selected group of American films as they reflect, shape or illustrate relevant aspects of American culture. Same as 45:600.

36B:605 Seminar: National Cinema 2-4 s.h.
Focus changes; emphasis on Great Britain, Italy, Sweden, Russia, Japan or United States.

36B:610 Seminar: Film Aesthetics and Criticism 2-4 s.h.

36B:615 Seminar: Film Theory 2-4 s.h.

36B:616 Seminar: Film History 2-4 s.h.

36B:620 Seminar: Broadcasting 2-4 s.h.
Focus changes; emphasis on history of broadcasting, political communications, international broadcasting, broadcast criticism, broadcast regulation, cable communication and public broadcasting.

36B:625 Seminar: Mass Communication Research 2-4 s.h.
Focus changes; critical review of theories and studies on various aspects of mass communication, including communication and political processes, audience behavior and methods for studying mass communication processes; individual research projects.

Dramatic Art

Codirectors: Howard Martin, Judith Milhouse, David Thayer
Degrees offered: B.A., M.A., M.F.A., Ph.D.

Bachelor of Arts

The requirements are:
11:51-52 Drama in Western Culture (to satisfy the historical-cultural core requirement);
A minimum of 32 semester hours of credit within the Department, or a combination of courses from this department and equivalent courses from other colleges or universities;
A minimum of 12 semester hours of credit for production/performance courses in the Department (or equivalent departments); and
A minimum of 12 semester hours of credit for nonproduction/nonperformance courses in the Department (or equivalent departments).

Students with sufficient talent and dedication may specialize in one or more production areas. Admission to second and third years of the production sequences is limited to students of superior ability. Work in all production and content areas is desirable for personal and professional advancement. Studies in history, literature, philosophy, social studies, art, music, dance and religion are encouraged. There is particular emphasis on choosing courses which will fulfill graduate department entrance requirements for those expecting to take advanced degrees. Students expecting to apply for teaching certificate should choose courses to satisfy departmental and state requirements.

Master of Arts

The program is designed for students who anticipate teaching at the high school and junior college levels and for those who want to earn an advanced degree before proceeding to the doctorate. The program consists of a combination of prescribed and elective courses covering the general areas of dramatic literature, criticism, theory, history and production. A thesis or graduate seminar in history, theory or criticism of drama or theater is required.

Master of Fine Arts

Students who demonstrate exceptional ability in playwriting, directing, design, acting, arts management or technical direction may apply for admission to the program of study and production leading to the M.F.A. Admission is dependent on recommendations and appropriate demonstrations of ability. Six semesters in residence and 48 semester hours are required, and students must reapply for admission each year. Substantial creative work of high quality is expected of all candidates.

Admission is based upon audition or portfolio of relevant artistic work, in addition to undergraduate record, other records of artistic accomplishment and letters of recommendation.

Doctor of Philosophy

The Ph.D. program in theater is designed to emphasize research and creative scholarship rather than general education or production.

Facilities

The Division's commitment to an extensive and varied production program is reflected in its use of four quite different theaters. Studio II is a large, flexible space in which class projects, highly experimental productions and readers' theater productions are performed with limited scenery before small audiences. The Old Armory Theatre is a 200-seat house with a large thrust stage. New scripts are produced in a converted lecture hall in MacLean Hall. The E.C. Mabie Theater is an excellently equipped proscenium theater which offers seating for almost 500 patrons. The Division also performs in Hancher Auditorium. Seating

2,680, this facility is used by the numerous professional touring shows which perform in Iowa City, and boasts the latest and most sophisticated stage machinery available.

To support its continuous production schedule and to provide its students with an appropriate range of experiences, the Division maintains several shops for the building, maintenance and storage of its scenery, costumes and properties. Using the three scene shops, students can learn to work in metal and plastics as well as canvas and wood. In lighting and sound, students are exposed to a range of equipment from the manual resistance lighting control and the two-channel sound systems of the Old Armory Theatre to the fully computerized lighting controls and the five-channel sound system used in Hancher Auditorium.

Courses

For Undergraduates

36T:9 Shakespeare 3-4 s.h.
Same as 8:9.

36T:13 Shakespeare 3 s.h.
Same as 8:72.

36T:51 Drama in Western Culture 4 s.h.
Required of all dramatic art majors. Same as 11:51.

36T:52 Drama in Western Culture 4 s.h.
Required of all dramatic art majors. Continuation of 36T:51; same as 11:52.

36T:61 Modern Drama 3-4 s.h.
Same as 8:3.

36T:62 Selected Plays 3 s.h.
Same as 8:53.

36T:63 Goethe's *Faust* 3 s.h.

For Undergraduates and Graduates

36T:100 Dramatic Art Laboratory arr.
Individual assignments in various aspects of dramatic production.

36T:101 Acting I 3 s.h.
Improvisational approach to actor training focusing on concentration, sensory awareness, imagination, and characterization. Corequisite: 36T:100, Section 5.

36T:102 Acting II 3 s.h.
Continuation of 36T:101. Scene study with emphasis on language, script analysis, characterization, and performance technique. Prerequisite: 36T:101; corequisite: 36T:100, Section 5.

36T:103 Acting III 3 s.h.
Advanced scene/role study for the actor. May be repeated. Admission by audition only. Prerequisite: 36T.51 or 36T:52.

36T:104 Acting Workshop 3 s.h.
Preprofessional actor-training for the advanced student. Admission by audition only. May be repeated. Corequisites: 36T:105, 36T:108, 36T:161.

36T:105 M.F.A. Acting Workshop 3 s.h.
Preprofessional training for classical, modern, and experimental theatrical forms. Admission by audition only. May be repeated. Corequisite: 36T:104, 36T:108, 36T:109, or 36T:161.

36T:106 Voice for the Actor 1 s.h.
Introduction to basic voice for the stage; relaxation, breath support, tone focus, and diction. May be repeated. Prerequisite or concurrent registration in 36T:102.

36T:107 Movement for the Actor 1 s.h.
Identification of individual movement problems, development of physical facility, movement exploration through structured and improvisational situations. May be repeated. Prerequisite or concurrent registration in 36T:102.

36T:108 Advanced Voice Training 2 s.h.
Preprofessional training in voice dynamics, stage diction, and vocal characterization. Course content varies by semester. May be repeated. Corequisite: 36T:104 and 36T:105.

36T:109 Advanced Movement Training 2 s.h.
Preprofessional training in movement dynamics, techniques of stage fighting, problems in physical characterization, and dance for the actor. Course content varies by semester. May be repeated. Corequisite: 36T:104 and 36T:105.

36T:110 Introduction to Theatrical Design 3 s.h.
Principles of design and their application to the stage in scenery, properties, costumes, lighting, and makeup. Corequisite: 36T:100. Same as 1P:194.

36T:111 Introduction to Theatrical Design 3 s.h.
Continuation of 36T:110. Prerequisites: 36T:110 and consent of instructor. Corequisite: 36T:100. Same as 1P:195.

36T:112 Production Design I 3 s.h.
Study of archetypal form in space, applied to problems of designing for theater. Prerequisites: 36T:111 and consent of instructor. Same as 1P:196.

36T:113 Production Design II 3 s.h.
Analysis of scripts, historical research, and development of production concepts for projects in scenery, costume, lighting, and property design; model construction and costume rendering. Prerequisites: 36T:111 and consent of instructor. Same as 1P:197.

36T:114 Studio for Theatrical Design 3 s.h.
Advanced projects for theatrical design in drama, opera, and design. Prerequisites: 36T:113 and consent of instructor. Same as 1P:198.

36T:115 Drafting of Scenery 2 s.h.
Drafting mechanics and conventions for theater designers and technicians. Corequisite: 36T:100.

36T:116 Rendering 2 s.h.
Exploration of rendering techniques for scenic, costume, and lighting designs. Corequisite: 36T:100.

36T:117 Staging Techniques for High School, College and Community Theatre 3 s.h.
Practical experience in analyzing the audiences to be reached, planning the season and preparing the play. Class projects include directing experience in presentation of scenes and preparing production books. Where possible site visits will be scheduled.

36T:118 Stagecraft I 2 s.h.
Basic techniques and preparation of lights and sound. Corequisite: 36T:100.

36T:119 Stagecraft II 2 s.h.
Basic techniques and equipment for preparation of scenery and costumes. Corequisite: 36T:100.

36T:120 Advanced Scenery Construction 2 s.h.
Analysis and solution of problems in construction and shifting of scenery. Prerequisite: 36T:127. Corequisite: 36T:100.

36T:121 Lighting 2 s.h.
Concepts and procedures for design of stage lighting. Prerequisite: 36T:118. Corequisite: 36T:100.

36T:122 Electrical Control in the Theatre 2 s.h.
Analysis of systems for control of sound, lights, and motion in theater. Prerequisite: 36T:118. Corequisite: 36T:100.

36T:123 Environmental Design I 3 s.h.
Prerequisite: permission of instructor. Same as 1D:137.

36T:125 Introduction to Arts Management 2 s.h.
Duties and organization of production personnel.

36T:126 Stage Makeup 1 s.h.
Application and design of stage makeup. Corequisite: 36T:100.

36T:127 Technical Production 2 s.h.
Intermediate construction, rigging, and shifting of scenery. Prerequisite: 36T:119. Corequisite: 36T:100.

36T:128 Scene Painting 2 s.h.
Lectures on scene painting materials, shop layout and techniques of applying scene paint; laboratory exercises at paint frame. Prerequisite: 36T:119.

36T:129 Costuming in the Arts 2-3 s.h.
Discussion of color theories, advanced techniques in paint and dye. Prerequisite: consent of instructor.

36T:130 Properties and Special Effects 2 s.h.
Construction and finishing of theatrical properties; development and control of special effects. Prerequisite: 36T:119. Corequisite: 36T:100.

36T:131 Stage Costume: Fabrics 2 s.h.
Selection and preparation of fabrics for stage costumes. Prerequisite: 36T:119. Corequisite: 36T:100.

36T:132 Stage Costume: Drafting and Draping 2 s.h.
Patterning and construction techniques for stage costumes with particular reference to period dress. Corequisite: 36T:100. Prerequisite: 36T:119.

36T:133 Stage Costume: Hats and Headdresses 2 s.h.
Construction of theatrical headgear including hats, helmets, masks and wigs. Corequisite: 36T:100. Prerequisite: 36T:119.

36T:134 Stage Costume History I 2-3 s.h.
History of dress in relation to stage costume.

36T:135 Stage Costume History II 2-3 s.h.
Continuation of 36T:134.

36T:136 Survey of Theatre History I 3 s.h.
Focus on the recreation of production conditions from 5th century Greece through 17th century France and England; specific areas of study include theater architecture, management, scenery, costumes, acting styles and audience composition.

36T:137 Survey of Theatre History II 3 s.h.
Continuation of 36T:136, from 18th century England to the present. May be taken out of sequence.

36T:138 Life Drawing II 3 s.h.
Same as 1F:105. Prerequisite: permission of instructor.

36T:139 Technical Direction Studio 2 s.h.
Seminar in theatrical production and management. Prerequisite: permission of instructor.

36T:140 Directing I 3 s.h.
Readings and exercises leading to fundamental technique for translating dramatic values of play text to stage; consideration of director's media, arrangement of stage picture and production procedures. Prerequisite: 36T:101.

36T:141 Directing II 3 s.h.
Study of art of play direction with emphasis on director as interpretive artist. Prerequisite: 36T:140.

36T:142 Directing Workshop 3 s.h.
Individual assignments to develop ability in various aspects

of play directing. May be repeated. Prerequisite: permission of instructor.

36T:143 Selected Dramatists 2-3 s.h.
Same as 8:143.

36T:144 Chinese Theatre 3 s.h.
Same as 39:149.

36T:145 Theatre Techniques in Television 3 s.h.
Production of scenes in television studio. Scenes are videotaped and reviewed.

36T:146 Graphic Design for the Theatre 2 s.h.
Theoretical and practical experience in developing concepts and camera-ready art work for promotional material. Prerequisite: consent of instructor.

36T:147 Production Management 2 s.h.
Organization and direction of theatrical production. Corequisite: 36T:100.

36T:148 Chinese Drama 3 s.h.
Same as 39:148.

36T:149 Theatre for Special Populations 3 s.h.
Experience in planning and presenting creative units which invite audience response and involvement; outreach to a variety of special populations, including children, public school, elderly, security and handicapped.

36T:150 Repertory Theatre arr.
May be repeated to maximum of six semester hours.

36T:152 Producing Musical Theatre 3 s.h.
Problems of staging the musical comedy.

36T:153 Workshop in Theatre Performance arr.
Discussion and application of directing techniques, technical practice and arts management procedures. Scheduling of such projects determined by interests of those enrolled. Ensemble warmup, improvisation, rehearsal and performance. Plays to be selected when company is known and to be performed during final week of term. Same as 7S:153.

36T:154 Play Script Analysis 3 s.h.
Analysis for theater artists. May be repeated by M.F.A. candidates.

36T:155 Basic Playwriting 3 s.h.
Analysis and practice of playwright's techniques in today's theater. May be repeated with consent of instructor. Corequisite: 36T:100. Same as 8W:155.

36T:157 Playwrights Workshop 3 s.h.
Presentation and discussion of work by members. Prerequisite: demonstration of outstanding talent. Same as 8W:157.

36T:158 Russian Drama in Translation 3 s.h.
Survey of Russian theater and drama from the medieval period through the present. Same as 48:159.

36T:159 Beginning Mime 2-3 s.h.

36T:160 Intermediate Mime 2-3 s.h.
Continuation of 36T:159, which is prerequisite.

36T:161 Period Styles of Movement 2 s.h.
Social conventions and dance of the Greek, Medieval, Elizabethan, and Restoration periods. Corequisite: 36T:104, 36T:105.

36T:164 Teaching Acting 3 s.h.
Presentation of techniques for an organic approach to the teaching of acting; students investigate, participate in, and construct training sessions which explore various methods of actor training.

36T:165 Playwrights Ensemble 2 s.h.
Creation and development of original roles in new plays in relationship with playwrights within a working ensemble; admission by permission of instructor. May be repeated once.

36T:169 Greek Drama in Translation 3 s.h.
Same as 14:106.

36T:170 Roman Drama in Translation 3 s.h.
Same as 20:106.

36T:171 Medieval Drama 3 s.h.
Secular and religious drama of Europe from 10th century to close of medieval period. Same as 8:144.

36T:172 Shakespeare 2-3 s.h.
Same as 8:122.

36T:173 Restoration Drama 3 s.h.
Same as 8:146.

36T:174 English Drama of the 16th Century 3 s.h.
Same as 8:147.

36T:175 Continental Drama, 1500-1700 3 s.h.
Renaissance drama, written and improvised, in Italy, Spain and France. Same as 8:165, 106:165.

36T:176 Continental Drama, 1700 to 1850 3 s.h.
Drama in Italy, France and Germany from the death of Racine to the close of the Romantic movement. Same as 106:176, 8:159.

36T:177 Modern Drama Ibsen to Shaw 3 s.h.
Same as 8:148.

36T:178 Selected Modern Dramatists II 3 s.h.
Same as 8:149.

36T:179 English Renaissance Drama 3 s.h.
Same as 8:145.

36T:180 Modern American Drama 3 s.h.
Same as 8:150.

36T:181 Contemporary Drama 3 s.h.
Working analyses of recent dramatic scripts through reading, discussion and rehearsal.

36T:182 Principles of Drama 3 s.h.
Same as 8:167.

36T:183 Cross Currents of Modern Drama 3 s.h.
Major forms of European drama, 1875 to World War II.

36T:184 Lessing 3 s.h.
Same as 13:182.

36T:185 American Theatre History 3 s.h.
Organization and operation of the American theater from its beginning (ca. 1750), but emphasizing developments from 1865 to present.

36T:186 Afro-American Drama 3 s.h.
Same as 45:180, 8:154.

36T:187 Ibsen and Strindberg 3 s.h.
Extensive readings.

36T:192 Backgrounds of Modern Theater Practice 3 s.h.
Theater theory and practice from Saxe-Meiningen to the present.

36T:200 Scenography Seminar 1 s.h.
Analysis and criticism of scenography of productions.

36T:209 Projects in Technical Direction 1-3 s.h.

36T:210 M.F.A. Production 1-4 s.h.
Appropriate assignments in all aspects of production of plays.

36T:212 Shakespeare: Early Plays 2-3 s.h.
Same as 8:252.

36T:213 Shakespeare: Later Plays 3 s.h.
Same as 8:253.

36T:265 Projects in Theatre arr.

36T:301 Practicum in Arts Management arr.
Involves the student with the support services necessary for arts events produced on campus and in the immediate community.

36T:302 Arts Management Seminar 3 s.h.
Explores issues and techniques in dealing with the management of performing and community arts activities.

36T:303 Legal Aspects of the Performing Arts 3 s.h.
The performing arts and the public regulation of contracts, copyright, collective bargaining, freedom of speech and other related topics.

36T:417 History of Criticism: Plato to 1700 3 s.h.
Same as 8:261, 48:261.

36T:418 History of Criticism: 1700-1950 3 s.h.
Same as 8:262, 48:262.

36T:463 Seminar: Literary Relations arr.
Same as 48:463, 8:463.

36T:620 Seminar: Dramatic Theory arr.

36T:622 Seminar: Theatre History arr.

36T:623 Seminar: Dramatic Literature arr.

36T:624 Seminar: Continental Drama arr.

36T:625 Seminar: Dramatic and Rhetorical Criticism arr.

Speech Pathology and Audiology

Department chair: Hughlett L. Morris
Faculty: *professors* James F. Curtis, James C. Hardy, David J. Lilly, Kenneth L. Moll, Hughlett L. Morris, Arnold M. Small, Jr., Duane C. Spreisterbach, Duane R. Van Demark, Dean E. Williams
professor emeritus Dorothy H. Sherman
associate professors Charles V. Anderson, Julia M. Davis, J. Bruce Tomblin
assistant professors Paul J. Abbas, John W. Folkins, Penelope K. Hall, David B. Hawkins, Richard R. Hurtig, Linda S. Jordan
instructors John M. Hanley, Neil T. Shepard
Affiliated faculty: *associate professor* Jeanne K. Smith
clinical assistant professors Carl E. Betts, Herbert N. Jordan, Ann A. Van Demark
clinical associates Kathleen M. Aller, Melanie N. Adair, Ruth A. Bentler, Ann M. Briggie, Mary Francis Edwards, Margaret Hauer, Kristen Kaylor, Patricia D. Keesee, Claudia Knutson, Mary W. Lowder, Mary K. Mills, Mary Collen Picek, Robert S. Pierce, Marcia S. Thompson, Michele F. Yauz
adjunct assistant professors David P. Kuehn, Gerald N. Zimmermann
Degrees offered: B.A., B.S., M.A., Ph.D.

The courses and degree programs of the Department of Speech Pathology and Audiology are planned to meet the needs of students seeking to prepare themselves for a wide variety of career opportunities. These include clinical service, college and university teaching, and research concerned with speech, language or hearing processes and disorders. The offerings also include courses for students with vocational and professional goals in other fields, such as psychology, education, speech and dramatic arts, dentistry and medicine, whose preparation may be enriched by the study of speech and hearing processes and their disorders. Holders of advanced degrees in this field provide clinical services for people

with speech, hearing or language problems in hospitals, community clinics, rehabilitation facilities and elementary and secondary schools; teach in colleges and universities; and/or conduct research in laboratories concerned with communication processes and disorders.

All professional programs of the Department leading to the M.A. degree are accredited by the Education and Training Board of the American Board of Examiners in Speech Pathology and Audiology.

Undergraduate Curricula

Since the master's degree or its equivalent is the minimum level of preparation for persons seeking professional careers in this field, the undergraduate curricula leading to B.S. or B.A. degrees in speech and hearing science do not qualify an individual to work professionally in this field but have as a primary purpose the preparation of students for graduate work. Hence, the undergraduate program emphasizes the normal processes of speech, hearing and language. These undergraduate programs also may be taken by persons who want a degree in the College of Liberal Arts but who do not desire a career in this field.

Students may qualify for either the B.S. degree or the B.A. degree with a major in speech and hearing science by completing, in addition to the general requirements prescribed by the College of Liberal Arts, the undergraduate departmental program given below:

Required Departmental Courses

3:15 Introduction to Speech and Hearing Processes and Disorders	3 s.h.
3:20 Phonetics of American English	3 s.h.
103:110 Articulatory and Acoustic Phonetics	3 s.h.
3:110 Anatomy of the Speech and Hearing Mechanisms	3 s.h.
3:112 Fundamentals of Speech Science	3 s.h.
3:113 Introduction to Hearing Science	3 s.h.
3:117 Psychology of Language I	3 s.h.
or	
103:100 Introduction to Linguistics	3 s.h.
3:118 Psychology of Language II	3 s.h.

Required Courses in Related Areas

29:113 Physics of Sound and Music	3 s.h.
31:143 Introduction to Statistical Methods	3 s.h.
31:1 Elementary Psychology	4 s.h.
or	
31:3 General Psychology	4 s.h.

A minimum of nine semester hours must be earned in one course from Group 1 and one course from Group 2, below, and one additional course selected from psychology, anthropology, and sociology.

Group 1

31:110 Learning and Motivation in Children	3 s.h.
31:111 Child Development	3 s.h.

Group 2

31:13 Psychology of Adjustment	3 s.h.
31:105 Personality	3 s.h.
31:163 Abnormal Psychology	3 s.h.

Other Requirements

Students majoring in speech and hearing science must also complete or have had the equivalent of college algebra and trigonometry, college physics dealing with light and sound, and a college course in the biological sciences.

Honors Program

The senior-year program leading to the B.S. degree with Honors in speech pathology and audiology is open to students who at the beginning of the senior year have completed at least 10 semester hours of coursework that can be counted toward a major in the Department, and have earned at least a 3.0 grade-point average on all major courses and all work at the University. For graduation with Honors, the student must complete two semesters of study in residence after entering the senior year Honors program; maintain a minimum grade-point average of 3.0 overall, for all courses in the major and in the required six semester hours of departmental Honors courses for seniors (Honors Seminar and Honors Thesis); and be recommended for graduation with Honors by the Honors thesis adviser and the departmental Honors adviser.

Students who are eligible and who are not already classified as Honors students should confer with the departmental Honors adviser before the beginning of the senior year. At any time during undergraduate study, students who have earned a minimum grade-point average of 3.0 and have not entered the University as Honors students may apply for Honors classification in the College of Liberal Arts and in this Department by recommendation of the departmental Honors adviser.

Advanced Degrees

Master of Arts Degree

The M.A. program in speech pathology and audiology may be a professional program to prepare the student for immediate placement in clinical service positions, or it may be a general program of graduate study leading to additional study for the Ph.D. degree. The various programs for the professional M.A. are necessarily specified to ensure that upon graduation the student will meet the requirements for immediate professional placement; the general M.A. program allows greater flexibility of individual program plans.

It is presupposed that the student has a background of undergraduate courses in speech and hearing science, development of oral communication and psychology of human behavior essentially equivalent to an undergraduate major in this field.

Entering M.A. degree candidates are required to take preliminary comprehensive examinations covering coursework in speech and hearing that is considered prerequisite to graduate study. The results of these examinations are considered diagnostic in nature, providing the student and faculty adviser with a basis for developing an appropriate plan of study. These examinations must be taken prior to first registration in the program. Portions of the examinations may be waived if the student chooses to take appropriate courses.

Professional Program

The professional M.A. program is designed to prepare clinicians in speech pathology and audiology who will be competent to function independently in a variety of clinical settings. Persons completing a professional M.A. program meet all academic requirements for clinical certification by the American Speech and Hearing Association. Four different curricula are provided. Each includes basic studies listed below under A, the requirements listed under one of the four

other sections (B, C, D, or E) and elective enrollments. The student should choose one of these four curricula in relation to career objectives and interests.

A total of 38 semester hours is the minimum required for a master's degree in this Department. Candidates for the professional M.A. degree are not required to present a thesis. However, students demonstrating research aptitude and interest are encouraged to do so. All candidates for the professional M.A. degree without thesis are required to take final written comprehensive examinations.

Requirements for the professional M.A. degree:

A. All Majors

*3:116 Neural Processes of Speech and Language	3 s.h.
*3:150 Foundations of Clinical Management	3 s.h.
*3:182 Articulation Disorders	3 s.h.
*3:185 Hearing Loss and Audiometry	4 s.h.
3:214 Children's Language Disorders	3 s.h.
3:244 Rehabilitative Audiology	3 s.h.
7C:199 Counseling for Related Professions	2-3 s.h.
Two advanced seminars or thesis	4 s.h.

Additional semester hours of practicum registration sufficient to meet supervised, direct clinical experience requirements for Certificate of Clinical Competence of the American Speech and Hearing Association and to provide broad supervised practicum experience.

(*Equivalent undergraduate course will be accepted as meeting requirements.)

B. Speech Pathology, General Clinical Emphasis

Courses listed under A and:

3:183 Stuttering	3 s.h.
3:212 Voice Disorders	2 s.h.
3:235 Neuropathologies of Speech and Language	3 s.h.
3:237 Cleft Palate	2 s.h.

Practicum, research and elective courses to bring total to at least 38 semester hours.

C. Speech Pathology Major, Emphasis on Clinical Work in Elementary and Secondary Schools

Courses listed under A and B, and:

7E:104 Remedial Methods in Speech and Hearing	2 s.h.
7E:192 Laboratory Practice in Elementary School	5 s.h.

Practicum, research and elective courses to bring total to at least 38 semester hours.

D. Audiology Major, General Clinical Emphasis

Courses listed under A, and:

3:120 Fundamentals of Laboratory Instrumentation	3 s.h.
3:121 Audiology Instrumentation Laboratory	1 s.h.
3:140 Manual Communication I	1 s.h.
3:240 Introduction to Diagnostic Audiometry	4 s.h.
3:241 Advanced Audiometry	4 s.h.
3:242 Amplification for the Hearing-Impaired	3 s.h.
3:245 Audiologic Procedures for Special Populations	3 s.h.

Practicum research and elective courses to bring total to at least 38 semester hours.

E. Audiology Major, School Hearing Clinician

Courses listed under A and D, and:

7E:104 Remedial Methods in Speech and Hearing	2 s.h.
7E:192 Laboratory Practice in Elementary School	3-5 s.h.

Practicum, research and elective courses to bring total to at least 38 semester hours.

Requirements for Employment

A number of states, including Iowa, require a state license in speech pathology or audiology for persons who work in locations other than the public schools. Students who meet the requirements listed above for the M.A. degree also meet the academic requirements for the license in Iowa, as well as in most other states.

Students preparing for clinical positions in public schools must meet the certification requirements of the states in which they plan to work. Completion of the following courses, in addition to those previously listed under C or E above, will meet the requirements of Iowa and most other states:

American government or American history	2-3 s.h.
7U:130 Exceptional Children	3 s.h.
7E:104 Remedial Methods in Speech and Hearing	2 s.h.
7E:192 Laboratory Practice in Elementary School	3-5 s.h.
Education electives	11 s.h.

General Program

The M.A. program for the student planning to continue to the Ph.D. degree is individually planned in consultation with the student's adviser. It usually includes a substantial portion of the courses previously listed for the professional M.A. program. Certain of the courses, however, may be omitted, deferred or replaced by other courses when appropriate for the student's plan of study leading to the Ph.D. degree. Students planning to continue to the Ph.D. degree are required to present a thesis as part of the M.A. program and successfully complete a final oral examination.

Doctor of Philosophy Degree

The Ph.D. program provides for comprehensive training for the scholar and researcher in speech and hearing processes and their disorders and also for more intensive specialization in particular clinical problems in which the student may have special interest.

The Ph.D. program is usually planned with specialization in speech pathology, audiology, speech science or hearing science. Within each area the candidate and adviser may provide for special emphasis through suitable selection of advanced seminars and research areas. Most students will find that their special interests lie in one or more of the four listed areas. The establishment of prescribed programs for these areas is not intended to circumscribe the graduate curriculum of the Ph.D. candidate who has specialized goals or interests which are not adequately met by these programs. Individual programs designed to meet special interests and goals are encouraged, provided only that the student's purposes are clearly defined and that he or she presents an adequate plan of study for their accomplishment.

Courses beyond those included in the departmental listings are drawn mainly from the areas of physics, engineering,

mathematics, statistics, physiology, neurology, anatomy and psychology.

The nature of the Ph.D. comprehensive examination is determined for each student by a five-member comprehensive examination committee. This committee, in consultation with the student, designs and carries out a plan for a comprehensive evaluation of the student's ability to function adequately in a research and/or academic environment. The evaluation must include both a written and oral performance. Candidates whose earlier training has not included a master's thesis will not fulfill the comprehensive examination requirement until they have completed a suitable research project and presented a paper summarizing its results. This project is to be of a magnitude appropriate for a master's thesis. It is expected that the comprehensive examination will be completed prior to the end of the student's first calendar year of full-time, post-master's study. The Ph.D. candidate must also successfully complete a dissertation based on original research in the area of specialization.

Recommended Courses

A. All Areas of Specialization

Courses, or their equivalents, required for M.A. degree, and the following additional courses:

3:120 Fundamentals of Laboratory Instrumentation
3:220 Advanced Laboratory Instrumentation
3:250 General Experimental Phonetics
3:590 Research Speech Pathology

3:591 Research Audiology
or
3:592 Research Experimental Phonetics

Statistics beyond introductory course
Courses in computer science
Courses in psychology (physiological, learning, motivation, personality)

B. Speech Pathology

Courses listed under A, and:

Seminars in areas of interest
Clinical practicums

C. Audiology

Courses listed under A, and:

3:254 Psychoacoustics
3:255 Psychoacoustics Laboratory
3:256 Physiology of Hearing
Seminars in areas of interest
Clinical practicum

D. Speech and Language Science

Courses listed under A, and:

3:254 Psychoacoustics
3:255 Psychoacoustics Laboratory
Seminars in areas of interest
Courses in linguistics and psycholinguistics
Courses in biological and physical sciences and mathematics

E. Hearing Science

Courses listed under A, and:

3:254 Psychoacoustics
3:255 Psychoacoustics Laboratory
3:256 Physiology of Hearing
31:224 Sensory Processes
Seminars in areas of interest
Courses in biological and physical sciences and mathematics

Students following programs in speech and language science or hearing science are normally expected to register for research credit during each semester of residence.

Admissions and Appointments

The Department of Speech Pathology and Audiology has requirements for admission and graduate appointment (financial) which supplement those specified by the Graduate College. Only a brief summary of these requirements is presented below. For more detailed information, contact the Department chair.

Special Admission Requirements

Scores from the aptitude tests of the Graduate Record Examination generally are required. Applicants may be admitted without such scores only in special cases.

All applicants must have a completed "Information Form" with the Department. This form can be obtained from the Department chair.

Admission into the master's program is based on consideration of an applicant's credentials in relation to those of other applicants for that term. Thus a minimum grade-point average cannot be specified exactly. As a general guideline, however, experience indicates that few students with undergraduate averages under 3.0 (B) will be admitted into the M.A. program. This does not imply that all applicants with a grade-point average greater than 3.0 will be admitted.

Admission Deadlines and Processing

Applicants to M.A. Program

Completed application to begin a program in summer session or fall semester must be received no later than the preceding February 1. Later applications will be considered only in special situations. Applications to begin study in the spring semester will be considered only under special circumstances and only if they are received no later than the preceding November 1. In most instances, applicants for summer session or fall semester will be notified of action on their admission between March 1 and April 1. Applicants for spring semester will be notified as soon as possible. In some cases, an applicant may be admitted only on the condition that he begins his program in a different term than the one for which he has applied.

Applicants to Ph.D. Program

Completed applications must be received at least two months prior to the beginning of the term for which application is made: approximately April 1 for summer session, July 1 for fall semester, November 1 for spring semester. However, if an applicant wishes to be considered for graduate appointment, the admission application must be filed by the deadline for appointment applications specified below. Applicants will usually be notified of action on their admission within six weeks after their applications are complete.

Applications for Graduate Appointments

The following information applies to all financial appointments (assistantships, fellowships, traineeships) administered by the Department:

Graduate appointments (financial) usually begin only in fall semester. Students beginning study in second semester or summer session are considered for appointments for the following fall semester.

Scores on the aptitude tests of the Graduate Record Examination are routinely required for consideration for financial assistance.

Appointment applications (financial) must be received by February 1 to insure consideration for an appointment beginning the following fall semester.

Initial appointment offers are generally made between March 15 and April 1; however, offers continue to be made after this time.

Clinical Facilities

The clinical training program derives great benefit from the fact that Iowa City is the health center of the state and that these health service facilities are located so that they may be fully utilized in the clinical training of students in speech pathology and audiology. The University of Iowa Affiliated Speech and Hearing Services are accredited by the Professional Services Board of the American Board of Examiners in Speech Pathology and Audiology. These affiliated services include the University of Iowa Speech and Hearing Clinic; Division of Speech and Hearing, Department of Otolaryngology and Maxillofacial Surgery; Speech and Hearing Services, University Hospital School; Speech and Hearing Services, Pediatrics—State Services for Crippled Children; Speech Pathology Service, Child Psychiatry; Audiology and Speech Pathology, Veterans Administration Hospital.

The University of Iowa Speech and Hearing Clinic serves the University and the general public. Included in its services are outpatient evaluations and rehabilitation programs for speech, hearing and language problems, and a six-week summer residential program for children. These clinical programs are planned for the training of students through supervised clinical experience with a wide variety of speech, hearing and language disorders. This training is enhanced by the use of the modern facilities of the Wendell Johnson Speech and Hearing Center, which include audiometric testing suites, diagnostic and therapy suites, a closed-circuit television system and modern equipment for diagnosis and therapy.

In addition to the clinical training in the University Speech and Hearing Clinic, such training may also be acquired in supervised clinical practice with elementary school children by arrangement with the Grant Wood Area Education Agency; in supervised clinical practice in speech and hearing services provided by the Department of Otolaryngology and Maxillofacial Surgery, Department of Pediatrics, Iowa State Services for Crippled Children, University Hospital School, Iowa City, Veterans Administration Hospital, and St. Luke's Methodist Hospital, Cedar Rapids.

Public and private departments and programs in addition to those mentioned above often contribute to the cooperative professional training, research and service programs.

Research Facilities

Research facilities in the Wendell Johnson Speech and Hearing Center include a number of fully equipped laboratories for the study of the basic processes of speech, hearing and language, and disorders of these processes. Included are laboratories and equipment for acoustic, physiologic and perceptual studies of speech and for audiologic, psychoacoustic and neurophysiologic studies of hearing. Well-equipped mechanical and electronic shops and trained technical personnel are available for assistance in research instrumentation.

Cooperation of various departments of the University Hospitals and the College of Dentistry makes it possible to utilize additional laboratory facilities for the investigation of a wide variety of research problems. Research opportunities are materially broadened by the active participation and cooperation of specialists from various fields, including psychology, child development, education, engineering and medicine.

Courses

3:15 Introduction to Speech and Hearing Processes and Disorders 3 s.h.
Speech, language and auditory behavior as field of scientific study; description of major types of speech, hearing and language disorders.

3:20 Phonetics of American English 3 s.h.
Concepts and principles of phonetic analysis; application of International Phonetic Alphabet to description and analysis of American English.

3:97 Honors Seminar 3 s.h.
Readings, reports, preparation of papers and discussion of research problems in speech pathology and audiology. Open only to Honors students.

3:98 Honors Thesis 3 s.h.
Preparation of major paper focusing upon research problem in speech pathology and audiology. Open only to Honors students.

3:110 Anatomy of Speech and Hearing Mechanisms 3 s.h.
Anatomy of peripheral and central structures of speech and hearing mechanisms; section on general neuroanatomy included.

3:112 Fundamentals of Speech Science 3 s.h.
Physiologic, acoustic, perceptual characteristics of speech; principles and methods for the laboratory study of speech. Prerequisites: 3:20, 3:110 and 29:113, or consent of instructor.

3:113 Introduction to Hearing Science 3 s.h.
Normal auditory process; review of acoustics, anatomy, physiology of the auditory system; subjective correlates of auditory stimulus. Prerequisites: 3:110 and 29:113.

3:116 Neural Processes of Speech and Language 3 s.h.
Neuroanatomy and neurophysiology related to speech and language processes; theories and research concerning brain function, neuromuscular processes and neural maturation. Same as 103:177.

3:117 Psychology of Language I 3 s.h.
Theoretical and empirical investigations of linguistic behavior; behaviorist and rationalist models discussed in context of formal linguistic structure as well as context of the models of speech perception and production. Same as 103:172, 31:113.

3:118 Psychology of Language II 3 s.h.
Alternative models of language acquisition; empirical data examined in context of theories of linguistic and cognitive development. Prerequisites: 3:117, 103:100, or consent of instructor. Same as 103:176, 31:153.

3:120 Fundamentals of Laboratory Instrumentation 3 s.h.
Introduction to basic electrical and electronic circuits and their applications in speech and hearing science; laboratory sessions provide familiarity with measurement techniques, circuit construction, impedance matching, filters, transformers.

3:121 Audiology Instrumentation Laboratory 1 s.h.
Supervised laboratory experience primarily for students in audiology; focus on measurement of environmental noise and on calibration and maintenance of audiometric equipment, filters, magnetic tape recorders, disc reproducers and hearing aids. Prerequisite or corequisite: 3:120.

3:140 Manual Communication I 1 s.h.
History and comparison of various sign language systems such as Amslan, Seeing Essential English and Signed English, and training in the use of manual communication.

3:141 Manual Communication II 1 s.h.
Continuation of 3:140 which is prerequisite. Emphasis is on the further development of skills in the use of manual communication.

3:142 Communicating with the Hearing-Impaired 2 s.h.
Introduction to deafness and sign language, with emphasis on Seeing Essential English, a visual representation of the English language; students learn to read and produce signs through videotapes, demonstrations, small group activities.

3:150 Foundations of Clinical Management 3 s.h.
Principles of clinical interaction; interviewing; structure of problem assessment and models of therapy; interprofessional relationships. Prerequisites: 3:15 and 3:20. Corequisite: 3:112 or consent of instructor.

3:176 Introduction to Speech and Hearing Processes and Disorders 3 s.h.
Same as 31:167.

3:182 Articulation Disorders 3 s.h.
Nature and causes of articulation disorders; diagnosis and management. Prerequisite: 3:150 or consent of instructor.

3:183 Stuttering 3 s.h.
Research and theory of stuttering behavior, causes, developmental factors, remedial procedures. Prerequisite: 3:15 or consent of instructor. Same as 31:165.

3:185 Hearing Loss and Audiometry 4 s.h.
Evaluation and treatment of hearing problems in children and adults. Prerequisite: 3:113.

3:186 Problems: Speech Pathology arr.
Prerequisite: staff consent.

3:187 Problems: Audiology arr.
Prerequisite: staff consent.

3:190 Introduction to Clinical Practice 1 s.h.
Students work with and observe various speech pathologists and audiologists, e.g., as communication aides with clinicians in public schools and other clinical settings; series of systematic remediation and evaluation observations made within the Speech and Hearing Clinic also may be required. Prerequisite: consent of instructor.

3:212 Voice Disorders 2 s.h.
Symptomatology and causes of disorders of voice; diagnosis and management; relevant research; problems of voice restoration following radical laryngectomy. Prerequisites: 3:112 and 3:150.

3:214 Children's Language Disorders 3 s.h.
Principal issues and research concerning the nature of children's language disorders as well as the assessment and treatment of such disorders. Prerequisite: 3:118.

3:218 Language Acquisition 3 s.h.
Current theory and data in four major areas of children's acquisition of language. An analysis of speech act competence and acquisition of conversational postulates. Same as 103:222, 31:253.

3:218 Experimental Psycholinguistics 3 s.h.
Detailed examination of the theoretical and empirical issues in psycholinguistics; specific models introduced to deal with the relation of the formal structure of language, and psychological operations utilized in speech perception and production; underlying argumentation as well as designs of empirical studies undertaken to test hypotheses about language processing. Laboratory sessions provide familiarity with paradigmatic research in psycholinguistics. Prerequisite: 3:117 or consent of instructor. Same as 103:218, 31:219.

3:220 Advanced Laboratory Instrumentation 3 s.h.
Continuation of 3:120 which is prerequisite. Laboratory sessions provide familiarity with circuit construction, power supplies amplification, signal generation, switching and timing, magnetic tape recorders, transducers.

3:224 System and Signal Theory for Speech and Hearing Sciences 3 s.h.
Reviews basic calculus and develops such topics as differential equations, convolution and system functions, leading up to the application of these principles of linear-systems theory to speech and auditory research. Prerequisite: introductory calculus.

3:235 Neuropathologies of Speech and Language 3 s.h.
Nature and principles of treatment of communication disorders associated with disease, trauma and abnormalities of nervous system, including dysarthrias, aphasias and developmental problems. Prerequisite: 3:116.

3:237 Cleft Palate 2 s.h.
Nature, etiologies, principles of treatment of speech disorders resulting from cleft palate. Prerequisite: 3:182 or equivalent.

3:240 Introduction to Diagnostic Audiometry 4 s.h.
Introduction to techniques currently used in diagnostic audiometry. Emphasis on principles and rationale underlying clinical procedures. Supervised laboratory sessions provide familiarity with test administration and evaluation. Prerequisite: 3:185. Prerequisites or corequisites: 3:120 and 3:121, or consent of instructor.

3:241 Advanced Audiometry 4 s.h.
Continuation of 3:240 which is prerequisite. Additional analysis of principles and rationale underlying clinical procedures. Laboratory sessions focus on test administration and calibration procedures. Corequisite: 3:311.

3:242 Amplification for the Hearing-Impaired 3 s.h.
Introduction to hearing aids: electracoustical characteristics, selection and evaluation strategies, special problems, counseling, and group systems. Lectures and supervised laboratory sessions. Prerequisites: 3:113, 3:185 or equivalent.

3:244 Rehabilitative Audiology 3 s.h.
Theory and procedures for assessment and rehabilitation of the speech, hearing and language deficits of the hearing-impaired. Prerequisite: 3:185 or equivalent.

3:245 Audiologic Procedures for Special Populations 3 s.h.
Theory and procedures for assessment and rehabilitation of pediatric, multiply handicapped and geriatric populations. Parent counseling and training procedures are included. Prerequisite: 3:185 or consent of instructor.

3:250 General Experimental Phonetics 5 s.h.
Summarizes current information and theory concerning acoustical and perceptual characteristics of speech; emphasis on research techniques including supervised laboratory projects. Prerequisites: 3:112 and 3:120, or consent of instructor. Same as 103:275.

3:252 Physiology of Speech Production 5 s.h.
Summarizes current information and theory on physiological bases of speech production; emphasis on research techniques including supervised laboratory projects. Prerequisites: 3:112 and 3:120, or consent of instructor. Same as 103:277.

3:254 Psychoacoustics 3 s.h.
Lectures and discussions on advanced topics and current research in auditory sensation and perception. Prerequisite: 3:113 or consent of instructor. Same as 31:271.

3:255 Psychoacoustics Laboratory 2 s.h.
Supervised laboratory experimentation; analysis of stimulus generation equipment; replication by students of classical psychoacoustic experiments. Corequisite: 3:254 or consent of instructor. Same as 31:272.

3:256 Physiology of Hearing 4 s.h.
Application of physiological techniques, primarily electrophysiological, to basic research in hearing; microanatomy of auditory system (AS), both peripheral and central; dynamics of cochlea; electrophysiological response at various levels in the AS, extirpation studies. Prerequisite: 3:113 or consent of instructor.

3:301 Practicum: Neuropathologies of Speech and Language arr.
Supervised clinical practice in areas of dysarthria, aphasia, cerebral palsy and other types of neurological problems associated with speech and language problems. Prerequisite: consent of instructor.

3:302 Practicum: Articulation Disorders arr.
Prerequisite: consent of instructor.

3:303 Practicum: Cleft Palate arr.
Supervised clinical experience with individuals with cleft palate. Prerequisite: consent of instructor.

3:304 Practicum: Voice Disorders arr.
Supervised clinical experience in diagnosis and remedial procedures for voice disorders. Prerequisite: consent of instructor.

3:306 Practicum: Children's Language Disorders arr.
Supervised clinical experience with language disorders of children. Prerequisites: 3:214 and consent of instructor.

3:308 Practicum: Stuttering arr.
Supervised clinical practice with stuttering problem. Prerequisites: 3:183 and consent of instructor.

3:310 Practicum: Aural Rehabilitation arr.
Supervised clinical practice with hearing-impaired children and adults. Prerequisites: 3:244 and consent of instructor.

3:311 Practicum: Hearing Measurement arr.
Supervised clinical practice in evaluation of individuals with hearing impairment. Prerequisites: 3:185 and consent of instructor.

3:320 Practicum: Diagnostic Procedures arr.
Supervised clinical practice in diagnosis of speech, hearing and language disorders. Prerequisite: consent of instructor.

3:520 Seminar: Articulation and Language Disorders 2 s.h.
An intensive review of critical issues and research in articulation and language disorders in children. May be repeated for credit. Prerequisite: 3:182 or consent of instructor.

3:521 Seminar: Stuttering 2 s.h.
Intensive, individualized study of theoretical issues and research literature. May be repeated for credit. Prerequisite: 3:183 or consent of instructor.

3:522 Seminar: Speech and Language Skills of the Mentally Retarded 2 s.h.
May be repeated for credit. Prerequisite: consent of instructor.

3:523 Seminar: Voice 2 s.h.
Systematic study and critical review of research on selected topics. May be repeated for credit. Prerequisite: consent of instructor.

3:525 Seminar: Cleft Palate 2 s.h.
Intensive, individualized study of theoretical issues and research literature related to speech disorders resulting from cleft palate. May be repeated for credit. Prerequisite: consent of instructor.

3:526 Seminar: Rehabilitative Audiology 2 s.h.
Intensive, individualized study of theoretical issues and research literature. May be repeated for credit. Prerequisite: 3:310 or consent of instructor.

3:528 Seminar: Neuropathologies of Speech and Language 2 s.h.
Individualized study of special topics concerned with problems of speech and language associated with neurological disorders. May be repeated for credit. Prerequisite: consent of instructor.

3:532 Seminar: Experimental Phonetics 2 s.h.
Selected topics in research and theory related to acoustic, physiologic and perceptual processes of speech. May be repeated for credit. Prerequisite: 3:250 or consent of instructor. Same as 103:370.

3:533 Seminar: Psycholinguistics 2 s.h.
Topics vary: cerebral dominance, perceptual processing and language; discourse theory; pragmatics—conversational competence; cognitive models of language. Prerequisite: consent of instructor. Same as 103:320, 31:352.

3:534 Seminar: Language Development 2 s.h.
Topics vary: development of pragmatic competence in children; relation of general cognitive development and the acquisition of language. Prerequisite: consent of instructor. Same as 103:321, 31:314.

3:535 Seminar: Psychoacoustics 2 s.h.
Detailed discussion of selected advanced topics in auditory psychophysics. May be repeated for credit. Prerequisite: 3:254 or consent of instructor.

3:536 Seminar: Experimental Audiology 2 s.h.
Intensive, individualized study of advanced topics and current research in experimental audiology. May be repeated for credit. Prerequisite: 3:241.

3:537 Seminar: Clinical Audiology 2 s.h.
Intensive, individualized study of current topics in clinical audiology. May be repeated for credit. Prerequisite: 3:241.

3:538 Seminar: Auditory Physiology 2 s.h.
Timely topics in auditory phonology, specific areas depend on the interests of the group. Permission of the instructor required. May be repeated.

3:590 Research: Speech Pathology arr.
Prerequisite: consent of instructor.

3:591 Research: Audiology arr.
Prerequisite: consent of instructor.

3:592 Research: Experimental Phonetics arr.
Prerequisite: consent of instructor.

Statistics

See "Mathematical Science."

Urban and Regional Planning

Program chair: Douglas B. Lee, Jr.
Faculty: *professors* Kenneth Dueker, James Harris
associate professor Douglas Lee
assistant professor David Forkenbrock
instructors Peter Fisher, Lloyd Turner
adjunct lecturers Paul Glaves, Andrew McKean, Todd Mozingo
Degrees offered: M.A., M.S.

Planning is a diverse and eclectic field, requiring a broad range of talents and skills and depending upon the resourcefulness of the individual planner to apply these skills effectively to the solving of problems of public policy. Emphasis is upon local governments as clients or employers, but regional, state, and federal levels also receive major attention, since all are involved in such problem areas as housing, land use, transportation, poverty, energy, and environment.

The Iowa program is unusual in that it covers all branches of the field within the same basic framework (represented by the core curriculum), independent of distinctions between physical planning, social planning, economic planning or policy analysis. It treats land-use planning, social program evaluation, and environmental quality as examples of the application of the same set of theories and skills.

An independent academic unit administratively located within the Graduate College, the Program has benefited from an opportunity to develop its curriculum and faculty without the constraints imposed by affiliation with another discipline or professional field.

Faculty and students in the planning program at Iowa bring to each other a wide range of experience and prior education. Fields represented within the faculty, on the basis of previous training, include planning, architecture, public policy, economics, operations research, geography, engineering, political science, and law. Students typically come from economics, political science, geography, architecture and landscape architecture, environmental sciences, engineering, anthropology, sociology, urban studies and planning, English, biology, history, classics, and philosophy, as a sampling. Since graduate students in the Program number about 50, students get to know each other, and a significant portion of the educational experience takes place in informal discussion.

The Program is fully recognized by the American Institute of Planners and the Association of Collegiate Schools of Planning, and meets Institute guidelines for professional education. Graduates compete successfully in the job market, securing positions which challenge their skills and stimulate their interests, whether they choose the more traditional area of local comprehensive planning or transportation planning, or the newer subfields such as housing, health planning, or environmental management.

Curriculum Structure

The planning and policy development curriculum comprises a 51-credit, four-semester (plus internship) program encompassing two academic years. Underlying the curriculum is the general philosophy that planners must develop both the theoretical and analytical skills which permit them to identify issues and recommend alternative ways for resolving them, as well as the professional skills (e.g., report writing, presentations and briefings, team management) which allow them to function effectively in organizational and political environments and facilitate the development of a social consensus. A competent student is equally at home with microeconomic theory, quantitative methodology, formal presentations to political bodies, and citizen participation.

Core Curriculum

The purpose of the Program's core curriculum is to provide a rigorous and consistent foundation for the consideration of policy issues, with an emphasis on theory and methods which have proven their usefulness in professional contexts. Because of the general applicability of the material, it is taught at a moderately high level of abstraction, relying upon examples and exercises to firmly implant the concepts.

Three functions are incorporated into the core:

Social Goals and Normative Criteria

Problems in the public sector involve a complex balancing of a large number of objectives (environmental quality, decent housing, equity, convenient transportation, etc.) which are seldom in commensurable terms, so maintaining a clear view while sorting through all the details and side issues demands a very strong normative framework.

Understanding Structural Relationships

Besides being able to distinguish better from worse, planners must have a sound operational comprehension of how the world works—the various economic, social, political, administrative, and legal systems through which collective problems are created, transmitted, addressed, and resolved.

Analytic Technique

A number of specific skills are broadly useful in the planning field. Some of these are quantitative (statistics, mathematics, forecasting, estimation, accounting, design of indicators, discounting, etc.), some are frameworks (cost-benefit, budgeting, impact assessment, equity impact evaluation), and some are less formal nonquantitative analytic procedures.

Throughout the program, the emphasis is on the use of simple, flexible methods which are well understood by the student and capable of producing results in a very short time if necessary. Techniques are designed and constructed in the context of, and in response to, each policy problem as it is encountered; there is little emphasis on teaching and cataloging numerous "standard" methodologies for future applications, because such methodologies seldom offer much insight into policy problems.

Core Courses

First Semester

102:202 Urban Development	2 s.h.
102:205 Economics for Policy Analysis	3 s.h.
102:207 History and Theories of Planning	2 s.h.
102:209 Urban Law and Legislation	3 s.h.
Introduction to Analytic Methods	3 s.h.

Second Semester

102:204 Collective Decision Making	3 s.h.
102:213 Urban Economic Analysis	3 s.h.
102:214 Public Expenditure and Revenue Analysis	3 s.h.
102:220 Intermediate Analytic Methods	3 s.h.
102:300 Laboratory in Information Systems and Presentation	2 s.h.

Third Semester

102:301 Field Problems in Planning	2 s.h.
Electives (Sectoral major)	9 s.h.

Fourth Semester

Electives (Sectoral major)	12 s.h.

Individual core courses do not align themselves simply with the three functions just described, and very few of the courses serve only one of the functions. A general pattern in the program's teaching is that pedagogical style is matched to the student's progress through the curriculum. Initial courses in the first semester tend to be derived from traditional disciplines (economics, political science, statistics) with student response in the form of exercises and exams; later courses are more synthetic, requiring the student to select, evaluate, organize, and draw conclusions, with more reliance on field problems in real or realistic settings. Intermediate courses are intended to develop critical judgment and insight in the application of theory, and depend upon case studies and extended examples.

Sectoral Majors

The second year of the program is directed toward the development of an area of concentration, the sectoral major, with nine credits in courses offered in various departments and schools of the University, including the planning program itself.

Currently, there are nine predesignated majors — land use, transportation, housing, social program evaluation, health policy and planning, environmental planning, urban services, regional planning, and urban management — and others can be designed by the student and approved by the faculty.

Sectoral majors are limited to choices among public policy problem areas, rather than permitting choices along some other orientation toward the field. Program requirements for the major cannot be satisfied, for example, by specializing in quantitative method, or public finance, or community organization. These subjects are important, but they are important to all planners and are included in the core.

The primary purpose of the sectoral major requirement is to reinforce the concepts presented in the core courses by applying them to specific issues in a limited policy area, i.e., to develop depth by concentrating on a particular set of problems. A secondary purpose is to enhance entry-level employment opportunities by having a sublabel within the planning field to refer to, as well as a modicum of specialized knowledge to draw upon.

The major is not intended, however, to produce narrow specialists, and students should not expect to become accomplished ecologists or systems engineers within the scope of the planning program.

Other Requirements

Students may request waivers of any core course, on the basis of previous training and experience. A two-part comprehensive examination is required for all students. One portion reviews skills and concepts contained in the core. The other evaluates the ability to synthesize knowledge within the sectoral major.

No thesis is required, although a student may petition to write one for up to six hours of sectoral major credit, in which case successful completion of the thesis satisfies the second part of the comprehensive examination.

All students are encouraged to secure an internship in a planning or related agency or organization and to submit a brief paper summarizing and evaluating the experience. Alternatively, the student may elect to complete an additional 2 hours of academic credit, bringing the total to 53 hours.

Joint Programs

Law and Planning

Urban and Regional Planning and the College of Law cooperate in administering a four-year program which satisfies the degree requirements leading to an M.A. or M.S. in planning and a J.D. in law. This is a reduction of one academic year from the total requirements of the two programs taken separately. Separate admission to both academic units is required.

Preventive Medicine and Environmental Health

Urban and Regional Planning and the Department of Preventive Medicine and Environmental Health in the College of Medicine cooperate in administering a program for health policy planners leading to the M.A. or M.S. in planning and the Ph.D. in preventive medicine and environmental health. Coursework is reduced from four to three years. Separate admission to both academic units is required.

Urban Transportation

The Urban Transportation Research and Training Program is administered by the Center for Urban Transportation Studies of the Institute of Urban and Regional Research. This Institute, and its Transportation Center, are a separately organized unit at The University of Iowa. The Center provides transportation certification to students in academic graduate departments at Iowa who satisfactorily complete a prescribed set of interdepartmental transportation courses. Planning students interested in transportation find this certificate program enhances the value of their departmental major in transportation. A separate admissions process is maintained for joint candidacy. For particulars, see the Urban Transportation section of this *Catalog*.

Social Work

A concurrent studies program is offered between Urban and Regional Planning and the University of Iowa School of Social Work, leading to the M.A. in planning and the M.S.W. in social work. Twelve semester hours in planning are accepted toward the M.S.W., and 12 semester hours in social

work are accepted toward the M.A. in planning. Separate admissions are required.

Financial Aid

Students in Urban and Regional Planning receive financial support through the tuition scholarships, program research assistantships, program teaching assistantships, contract or grant-funded research assistantships, and internships in local agencies. All but tuition scholarships require from 10 to 20 hours of work per week under the direction of a faculty member or professional planning staff.

Awards are made on the basis of merit, experience, interests, and need. It is the attitude in the Program that students needing income to attend school should be supported by projects which draw upon and develop skills relevant to planning. We have been successful in providing compatible work for a majority of our graduate students.

Admission

Admission is open to individuals having any undergraduate major or area of concentration.

Admission is based on GRE test scores (quantitative and verbal), letters of recommendation, and undergraduate achievement.

Applicants are requested to have the application form and the above-mentioned materials submitted by March 15 for fall admission or by November 1 for spring admission. Fall admission is preferred unless the student has substantial advance preparation or expects to spend more than two years.

Courses

102:101 Introduction to Planning Policy Development 3 s.h.
Historical development of urban problems and current policies; planning practice and issues at all levels of government; interaction of technical and political aspects of the resolution of social problems.

102:102 Case Studies in Urban and Regional Planning 3 s.h.
Survey of current issues in planning, presented from actual experience; areas include housing, land use, environment, transportation, planning law, political economy, program evaluation, health, and regional planning.

102:108 Housing Analysis 3 s.h.
Housing finance, supply and markets; definition of public interest manifested in legislation and regulation; design practices and alternatives; quality of residential environment.

102:111 Introduction to Urban Transportation 3 s.h.
General overview of urban transportation defining the land use/transport system, the urban transportation planning process, travel characteristics; introduces concepts of travel behavior, mobility deprivation, and accessibility; discussion of transportation law and legislation, the interface of transport agencies with other urban services and transportation problems in Iowa City.

102:125 Readings in Planning arr.
Individual study with faculty member; focus of readings will be agreed on by student and faculty member. Undergraduates admitted.

102:202 Urban Development 2 s.h.
Traces the evolution of urbanized areas from a multidisciplinary perspective and examines the effect of urban policies on political, economic, and social systems.

102:204 Collective Decision Making 2-3 s.h.
Study of positive and normative theories of decision making as they relate to planning; examines theories of the state, models of individual and group choice, the politics of social change, possibilities for systematic planning in governmental bureaucracies.

102:205 Economics for Policy Analysis 3 s.h.
Fundamentals of microeconomic theory applied to problems of planning and policy analysis; includes theory of the firm, consumer demand, market structure and price determination, economic efficiency and social welfare, market failure and the theory of government.

102:206 Professional Planning Practice 1 s.h.
Description and discussion of current professional planning practice and its organizational and political context, with emphasis on local comprehensive planning. At least a portion of the presentations are by practicing planners and related professionals and administrators.

102:207 History and Theories of Planning 2 s.h.
Evolution of planning doctrines; introduction to modern planning practice; roles and functions of the planner from several viewpoints; organization of planning profession, state and regional planning, federal programs, local planning administration.

102:208 Urban Housing 3 s.h.
Housing finance, supply and demand analysis, production, management, design of housing and the quality of urban residential services, historical view of housing and public policy. Available to planning students; others see 102:108.

102:209 Urban Law and Legislation 2-3 s.h.
Foundations of American constitutionalism, legal method, local government law, and the legislative process, from the perspective of constraints and controls on the local policy and planning process; evaluation of existing land use and related law against social objectives, and consideration of alternatives.

102:212 Health Policy and Planning I 3 s.h.
Introduction to basic components and problems of health care delivery systems; emphasis on basic planning and policy issues; pricing, resource allocation, health statistics, health demography.

102:213 Urban Economic Analysis 3-4 s.h.
Application of economics and location theory to the analysis of the structure and development of urban areas; special attention to problems of the urban land market and decentralization, housing markets and housing policy, urban poverty and economic development, transportation, and the environment.

102:214 Public Expenditure and Revenue Analysis 3 s.h.
Application of the concepts of market failure, efficient public intervention, and equity to analysis of urban fiscal problems, fiscal federalism, income distribution policies, taxation, and the pricing of urban public services; includes principles of local government budgeting, capital expenditure planning and cost-benefit analysis.

102:215 Regional Economic Analysis 3 s.h.
Income, product, expenditure, balance-of-payments and other regional social accounts; economic base, shift-share, and regional multiplier analysis; input-output and regional econometric modeling; impacts of national and regional economic development programs.

102:216 Health Policy and Planning II 2-4 s.h.
Emphasis on the comprehensive planning process for health care delivery systems; statutory framework and funding; evaluation of various proposals for reform of system components and cost control.

102:220 Intermediate Analytic Methods 3 s.h.
Intensive survey of tools for planning analysis: sample surveys, index number construction, multiple regression, population and employment forecasting, economic base models, design and evaluation of policy experiments.

102:222 Advanced Planning Methods 3 s.h.
Topics in advanced methodologies applied to planning; operations research, systems analysis, urban services management, modeling, research design and implementation for policy analysis, work programming, information systems and other management techniques.

102:224 Principles of Urban Design Theory 2-3 s.h.
Physical development of urban form; determination of basic concepts in design of cities, parts and details thereof; urban design as a factor of societal development.

102:225 Readings arr.

102:226 Seminar Transportation Planning Issues 3 s.h.
Process and policy considerations related to transportation planning; investigation of current issues and methodologies employed in transportation planning. Prerequisite: 102:111 or consent of instructor. Same as 44:226.

102:227 Geographic Information Systems 3 s.h.
Application of information system concepts to spatial analysis and planning; data processing of small-area data to support research and planning. Prerequisite: consent of instructor. Same as 44:227.

102:230 Special Problems in Planning arr.
Investigation of problems of special interest to students and faculty, with approval of Program faculty. May be repeated for credit.

102:231 Seminar Social Planning 3 s.h.
Analysis of social policy areas such as housing, education, employment, health care; emphasis on philosophical foundations of analysis as well as on methodology. Prerequisite: consent of instructor.

102:233 Planning and Land Use Controls 3 s.h.
Examines traditional zoning control, flexible control and market devices, PUDs, state land use planning, critical area controls, growth management, exclusionary zoning, fair share housing, and other topics.

102:234 Project Impact Analysis 3 s.h.
Analysis and evaluation of the economic, social, environmental, and fiscal impacts of major public and private capital investment projects; includes techniques and case studies of cost-benefit analysis, environmental impact assessment, and cost-revenue analysis.

102:238 Environmental Policy and Planning I 3 s.h.
Identification and evaluation of valuable resources in the natural environment, and design of mechanisms for protecting and giving consideration to these resources in collective decision making.

102:242 Organizational Policy Analysis 2-3 s.h.
A study of organizations as the principal entities through which public policy and planning are agitated and settled; both governmental bureaucracy (supply side) and private sector interest group organizations (demand side) analyzed.

102:243 Environmental Policy and Planning II 3 s.h.
Special problems and case studies in environmental analysis.

102:255 Historic Preservation Planning 3 s.h.
Survey of programs and methodologies for assessing and conserving structures and sites of historic or architectural significance; easements, districts and other instruments for protecting historic resources.

102:260 Transportation Policy and Planning 3 s.h.
Efficiency and equity impacts of alternative investment programs and system management policies; evaluation of transportation services as a public enterprise; land use/transportation interrelationships and consequences of financing by means of user charges versus general funds. Theory and case studies.

102:261 Problems in Transportation and Land Use 3 s.h.
Individual projects on policy problems of local or state interest in Iowa, proceeding from issue identification to presentation of results to potential clients; examples include highway finance, truck user fees, inland waterway investment, cost-benefit study of major freeway segments, railroad branch line abandonment, rural transit evaluation.

102:275 Urban Growth in Developing Countries 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Same as 113:275, 8E:275, 42:275, 34:275, 44:275.

102:279 Independent Study in Planning 3-6 s.h.

102:280 Thesis in Urban and Regional Planning arr.
Research and analysis of special planning problem selected by student with approval of faculty, developed to provide opportunity for student to apply knowledge obtained in area of specialization.

102:300 Laboratory in Information Systems and Presentation 2 s.h.
Introduction to information system concepts, graphic display techniques, and communication skills; problem sets are used to develop skills in data collection, analysis, presentation, and interpretation.

102:301 Field Problems in Planning 2 s.h.
Problems drawn from professional practice: park and recreation planning, solid waste management, a special improvement district, urban renewal, and housing are examples of subject areas for cases; problems variously emphasize work programming, team management, individual research, oral presentation, fieldwork.

102:303 Program Design and Evaluation 3 s.h.
Seminar; students select individual or group project in various substantive areas such as housing, health, transportation, and regional development.

102:311 Transportation Program Seminar 1-3 s.h.
Students in the transportation certificate program are required to enroll in this course each semester. May be repeated for credit.

Urban Growth in Developing Countries

Program coordinator: Michael L. McNulty

A nondegree graduate program of interdisciplinary and cross-cultural seminars and courses focused on problems of development in Third World countries is offered through the Center for Development Studies within the Institute of Urban and Regional Research. Intended to facilitate and coordinate interdisciplinary instruction and research, the program is available to graduate students from departments throughout the University.

In addition to a number of development-related courses offered in specific departments, the program includes a graduate course, Urban Growth in Developing Countries, in the departments of Anthropology, Economics, Geography, Political Science, Social Work, Sociology, and Urban and Regional Planning. Taught by an interdisciplinary team, the course introduces students to the analysis of urban problems in developing countries from a cross-cultural and interdisciplinary perspective.

A graduate workshop is intended to provide a forum for graduate students and faculty members from a variety of departments to meet regularly to discuss problems of mutual interest. Additional information may be obtained by contacting the program coordinator.

Urban Transportation

A graduate program consisting of both education and research is offered by The University of Iowa's Center for Urban Transportation Studies. The program encompasses the interactions of an urban society with the various modes of passenger and freight transportation. Active participation of nine academic disciplines allows the student to assemble a program spanning physical, economic, legal, social and institutional elements. It is this multi-disciplinary exposure which distinguishes this program from the more traditional graduate urban transportation programs.

An effort is made to integrate issues of economic evaluation of alternative investments, environmental quality, travel demand, urban spatial structure, land use impacts of transportation, transit management and planning, and distributional equity into a technically sound synthetic framework.

With few exceptions, graduates of the program are currently employed in a variety of functions in the transportation field.

The Graduate Program in Urban Transportation draws upon courses offered by participating departments and is coordinated by the Center for Urban Transportation Studies within the Institute of Urban and Regional Research. Academic certification has been authorized by the Graduate College of The University of Iowa, and is documented on the student's transcript. Students admitted into the program participate in conjunction with the established degree (M.A., M.S., M.B.A., Ph.D. or J.D.) arrangements of their individual departments, programs and colleges. Students who are enrolled, or who expect to enroll in the following University disciplines, are invited to apply for admission to the Graduate Program in Urban Transportation: Business Administration, Economics, Geography, Law, Political Science, Psychology, Sociology, Systems Engineering, and Urban and Regional Planning.

Requirements

The Urban Transportation Program is not a degree-granting program, but instead issues a transportation certification to students, enrolled in degree-granting departments, who complete an approved course of transportation study. The student should design a course of study in consultation with his/her adviser or the director of the Urban Transportation Program. The course of study must be approved by the Urban Transportation Program Executive Committee prior to admission to the program.

The course of study should consist of 18 hours of transportation courses and transportation-related courses. Twelve of the 18 hours must be transportation courses, and the remaining six hours must be in transportation-related courses outside the student's discipline. Students must be enrolled in the Transportation Program for a minimum of one year (two semesters) to receive a transportation certificate. To insure knowledge of basic transportation planning and sufficient depth in a special area, the student must complete the core courses and fulfill one option as part of the 12 hours of transportation. The core consists of three required courses:

102:111 Introduction to Urban Transportation (can be waived for students with prior training and/or experience in transportation)
587:272 Urban Transportation Planning
102:260 Transportation Policy and Planning

In addition, students must enroll in 102:311 Transportation Program Seminar each semester they enroll in the Urban Transportation Program. Credits for 102:311 do not count toward the 18-credit hour requirement. Two options are available to Transportation Program students. 102:261 Problems in Transportation and Land Use must be taken to complete the transportation policy option. 583:173 Transportation Systems Design must be taken to complete the transportation design option.

To achieve the interdisciplinary goal of the Urban Transportation Program, the student should make every attempt to take a course from all Transportation Program faculty, as they represent the various disciplines germane to transportation planning.

Students are strongly encouraged to gain practical experience in transportation research by completing a thesis or major paper, either in conjunction with a course (such as 102:261) or a research assistantship. All students should insure that the executive committee has a current course of study approved and on file. Students currently enrolled in the Transportation Program should review their course of study with the program principles in mind to determine whether alterations are necessary.

Research

Problems of small urban systems and low density states are emphasized in research projects. Through a combination of coursework and research activities—surveys, analysis of local transit systems, design and monitoring of small demonstration projects, etc.—it is believed students will develop skills and receive a practice-oriented educational experience in areas such as travel behavior, transit systems design, transit finance, and impact evaluation.

Urban and regional laboratories available for this learning process (Coralville, Iowa City, Cedar Rapids, Quad Cities and Johnson County) provide an attractive range of smaller urban and regional systems within which to study travel behavior and transit planning.

All students financially supported in the program participate in the transportation research of the Center; latitude is provided for students to develop their own research activities.

Student Support

Fellowships, research assistantships, tuition scholarships and summer assistantships are awarded on a competitive basis with the level of financial support ranging from quarter-time research assistantships ($250 per month for the academic year) to half-time research assistantships ($500 per month). All out-of-state students receiving research assistantships are eligible for in-state tuition. Students receiving financial support during the academic year are eligible for half-time summer research assistantships, as funding permits; these assistantships are generally awarded for two months at $500 per month.

The financial support indicated above is not intended to span all potential sources available within the University, but only to indicate the typical levels of financial support within the Center for Urban Transportation Studies.

Admission

Application for admission to the Graduate Program in Urban Transportation is made by submitting a duplicate University application form, two letters of reference, and a brief statement relating the nature and extent of the applicant's interest in urban transportation.

Women's Studies

Program Chair: Sarah H. Madden

The Women's Studies Program is a multidisciplinary program engaged in developing a body of knowledge about women and institutionalizing that knowledge within the university community. The term "women's studies" does not connote segregated education for women but emphasizes teaching and research about women which is of intrinsic interest to all students. This new academic dimension in education forms a cumulative pattern of learning about women and supplements neglected areas of study in the existing curriculum, raises provocative intellectual questions about the human condition as a whole, and opens wider the quest for truth.

Undergraduate students may elect varied courses from the disciplines listed below or may choose an area of concentration in Women's Studies within the Bachelor of General Studies degree. Graduate students may choose an area of concentration within existing academic disciplines or may create an interdisciplinary prospectus.

For information on faculty members in varied departments who will direct graduate study, contact the Women's Studies Program, 305 English-Philosophy Building. For detailed descriptions of the courses listed below, consult the appropriate department, school, or program in this *Catalog*. Since the topics of some courses change from year to year, students should refer to the schedule of courses for pertinent information.

In addition to courses listed in the regular course schedule, Women's Studies courses for University credit are offered by the Saturday and Evening Class Program and by Correspondence Study. Noncredit classes are taught at the Women's Resource and Action Center.

Afro-American Studies

45:128 The Black Woman in America

American Studies

45:2 Issues in American Culture
Sections include Homosexualities in American History and Culture, 1566-1960; Women's Movement in the United States; Writings of American Women; and Women and Work

Anthropology

113:156 Women's Roles: Cross-Cultural Perspective

Art and Art History

1H:190 Themes in Art History: Women Artists of the 20th Century

Basic Skills

10:3 Rhetoric
Feminist section

10:31 Physical Education Skills
Sections on self-defense for women

Classics

14:103 Women in Antiquity

Core Literature

11:15 The Literary Presentation of Women

East Asian Languages and Literature

39:193 Asia: Half the World Women in China, Japan, and India

Education

7F:110 The Evolution of Women's Roles in Education
7C:112 Human Sexuality
7C:140 Sex Role Stereotyping and Socialization in Education
7C:150 Psychological Aspects of Women's Roles
7C:260 Issues and Applications in Counseling Women

English

8:110 Selected Authors Dickinson, Plath, Rich, Levertov, Wakoski
8:114 American Regional Literatures Southern Women Writers
8:125 Modern British and American Poetry: Women Poets of Britain and America
8:131 The Narrative Tradition: British Women Novelists Since Aphra Behn
8:157 Biography and Autobiography: Women's Lives—Autobiographies and Biographies of British Women
8:161 Women in Literature: Representative British and American Writers
8:169 Changing Concepts of Women in Literature
8:176 Literature and Philosophic Thought
8:434 Seminar in 20th-Century British Literature: Virginia Woolf

French

9:140 Studies in the Novel: Some Women Writers in France, England, and America

German

13:123 Women in German Literature

History

16:158 Society and the Sexes in Traditional Europe
16:159 Society and the Sexes in Modern Europe
16:181 Studies in Women in America, 1600-1870
16:182 Studies in Women in America After 1870
16:258 Readings: Women in European History
16:284 Seminar: History of American Women
16:287 Readings: History of American Women

Home Economics

17:118 Sexuality and the Family

Law

91:293 Discrimination in Employment
91:350 Sex Discrimination Law

Nursing

96:106 Historical, Philosophical and Social Foundations of Nursing

Physical Education

28:108 Principles and Administration of Intercollegiates for Women
28:242 Seminar: Health Concerns of Women
28:254 History of Women in Sports

Psychology

31:116 Psychology of Sex Differences

Social Work

42:199 Selected Aspects of Social Work and Social Welfare
Section on Social Work and Women's Roles

Sociology

34:50 Women in Society
34:108 Sociology of Sex Roles: Introduction to Women's Studies

Spanish and Portuguese

35:140 Introduction to Basque Language and Culture
35:141 Images of Women in Hispanic Literature
35:142 Basque Language and Culture II

Speech and Dramatic Art

36:137 Sex Roles and Communication
36B:142 Film and Ideology: Images of Women
36B:160 Film Styles and Genres: Images of Women in Film

World Order Studies

Since 1972, The University of Iowa has been working to develop a multidisciplinary undergraduate program in World Order Studies. The purpose of this program is to give students an opportunity to study and acquire skills in the analysis of some major contemporary global problems which cannot be covered adequately by any one department. The program initially developed is now under review.

All other courses relevant to this program have been and continue to be offered in their respective departments.

For further information on program status, contact the Office of the Vice President for Educational Development and Research.

Course

000:100 Global Interdependence and Human Survival **3 s.h.**

Zoology

Department chair: Eugene Spaziani
Faculty: *professors* Richard V. Bovbjerg, Hugh Dingle, Joseph Frankel, Joseph Hegmann, Richard G. Kessel, Jerry J. Kollros, John Menninger, Roger D. Milkman, James Dawson Mohler, Eugene Spaziani, Barbara A. Stay, Norman E. Williams
professors emeriti Harold Beams, Gordon Marsh, Luther O. Nolf, Eleanor H. Slifer
associate professors George D. Cain, Gary Gussin, Stephen P. Hubbell, Stanley B. Kater, David Soll, Michael Solursh
assistant professors Henry Howe, Leslie K. Johnson, Carol S. Newlon, Chun-Fang Wu
Degrees offered: B.A., B.S., M.S., Ph.D.; M.S. in biology, jointly with the Botany Department

Undergraduate Program

The undergraduate degree program in zoology provides a sound liberal arts background for a career in biological science. Graduates may enter directly into government service or industry. The program also prepares students for advanced degree programs leading to the research, teaching (university, four-year college, community college, secondary and primary schools) or health professions (medicine, dentistry, paramedical).

The basic courses offered in the Department serve both its own majors and others planning to enter health-related professions, or fields such as psychology, anthropology and sociology, as well as students in other fields who have a cultural interest in biological science.

A one-semester introduction, 37:3 Principles of Animal Biology, stresses the major concepts and is ordinarily the first course taken in the Zoology Department. Majors must also take basic courses in genetics (usually immediately following the introductory course), evolution and cell physiology. Beyond this "core" curriculum, the student has a virtually unrestricted choice of 100-level courses in zoology, to a minimum of 33 semester hours. A student may substitute 100-level coursework in other areas of natural science or in mathematics (exclusive of the specific course requirements listed below) for up to eight hours of the 33-hour total in zoology. Courses required for a B.A. or B.S. degree in zoology are:

In other departments:	
8W:10 Expository Writing	3 s.h.
22M:16 Calculus for the Biological Sciences	3 s.h.
or	
22M:25 Calculus I	4 s.h.
4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Elementary Chemistry Laboratory I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
99:120 The Chemistry of Biological Materials	3 s.h.
29:17-18 Introductory Physics I-II	8 s.h.
or	
29:11-12 College Physics	8 s.h.
	28-29 s.h.
In Zoology:	
37:3 Principles of Animal Biology	5 s.h.
37:128 Fundamental Genetics	3 s.h.
and	
37:129 Fundamental Genetics Laboratory	2 s.h.
or	
37:109 Genetics	3 s.h.
37:105 Cell Physiology	4 s.h.
37:131 Evolution	4 s.h.
Total	17-18 s.h.
Electives zoology, other science, mathematics	15-16 s.h.

Courses which may be used to fulfill the 33-hour requirement in zoology include 37:3 and any course numbered 100 or above (other than 37:125), except that no more than three hours can be included from 37:196-199. In addition, up to 8 hours of courses beyond the requirements in other natural sciences and mathematics may be substituted, subject to the following limitations: (a) Courses taken in the departments of Botany, Chemistry, Geology, Physics and preclinical departments of the College of Medicine must be numbered 101 or above; any such 100-level course may be used except 12:125 A Planet In Crisis and other comparable courses directed primarily at nonscience students.(b) Any course taken in the Division of Mathematical Sciences must have 22M:25 Calculus I as a prerequisite.

Students are encouraged to take courses in zoology and other sciences beyond the required minimums.

Honors

Students in the college-wide Honors Program may earn an Honors degree in zoology by completing a total of at least six semester hours in 37:196 Honors Laboratory Research, 37:197 Honors Readings in Zoology, and 37:198 Honors Seminar in Zoology.

Introduction to Research

The Department offers membership in a small, active group of undergraduates with common interests, and association with one of the Department's research groups. Experiments, running discussions of current research, the study of specialized topics and attendance at research lectures are pursuits of practicing scientists to which the students are introduced. An introduction to research activities can be obtained within or outside the scope of the Honors Program and may be pursued in summer as well as during the academic year.

Graduate Programs

The graduate programs of the Department are designed to prepare students for different kinds of professional activities, including teaching at various levels, participation in research in private, educational or government laboratories, or other kinds of professional service, frequently involving some planning or administrative functions. More than 80 percent of the doctorates of the last two decades have been engaged in college or university teaching. A substantial number of students completing their training with an M.S. degree have obtained technical or professional positions, some of which require independent responsibility in performance or planning.

Each member of the Department carries out research. Programs in cell biology, developmental biology, genetics, molecular biology, neurobiology, ecology, behavior, physiology and parasitology are included in the Department, and most of these have auxiliary aspects which are served through work in other departments, sometimes with joint sponsorship of faculty in these departments. For purposes of student advising, these programs have been consolidated into four general areas: developmental biology, ecology and behavior, genetics, physiology. Each student selects one of these areas as a specialty, and is thereafter advised by the faculty of that area; his or her progress toward meeting the requirements of the advanced degree program is monitored by the faculty of that departmental area.

The faculty area committee can specify courses which must be taken or audited. It can recommend that particular teaching or research experiences be sought. It has the obligation of offering advice and counsel. It is responsible for producing the M.S. examination, administering it and providing faculty members for the formal committees which oversee M.S. theses and evaluate the examinations. When a student is approved for continuation toward a Ph.D. degree, he or she selects an advisory committee of five (one from outside the Department), and that committee is thereafter responsible for advising and monitoring the student's progress.

The M.S. Degree in Zoology

The M.S. degree with thesis requires 30 semester hours of graduate credit and a thesis based on original research. Ordinarily six to eight semester hours are assigned to thesis research and writing. The remaining hours are to be selected in consultation with the student's advisory committee, and the choice of courses will be tailored to the student's background and career goals. Credit can be received for courses the student is required to take on the basis of the diagnostic examination (see "orientations" below), but not for courses required by the Admissions Committee to make up undergraduate deficiencies. After the thesis is accepted, the candidate must pass an oral

examination based mainly on the work reported in the thesis and on related subject matter.

The M.S. degree without thesis requires 34 semester hours of graduate credit and a library research report. No more than four semester hours of credit may be granted for the research report. Credit may be earned in graduate courses in zoology or cognate sciences, these courses to be determined in consultation with the student's thesis committee and tailored to fit the student's background and career goals. Credit received in courses at the 100-level or above, with the exception of courses in zoology required to make up deficiencies revealed by the diagnostic examination (see above), may be included in the 34-hour minimum if approved by the advisory committee. On completion of the hours requirement and acceptance of the research report by the student's faculty sponsor, the student must pass a written examination covering his or her graduate program in zoology, including the area of the student's report.

The M.S. Degree in Biology

Thirty semester hours of graduate credit are required of all students who earn this degree with thesis. Ordinarily six to eight semester hours are assigned to thesis research and writing, eight to twelve semester hours to graduate courses in zoology, eight semester hours to graduate courses in botany and the remaining semester hours to free electives. Following acceptance of the thesis, the candidate must pass a written examination covering graduate programs in botany and zoology. This is followed by an oral examination based mainly on the work reported in the thesis. The Botany and Zoology departments offer a 34-semester-hour program leading to the M.S. in biology, without thesis.

The Ph.D. Degree in Zoology

For each Ph.D. degree candidate a departmental committee is formed, of which the candidate's faculty sponsor is chairman. The committee is charged with establishing those formal course or proficiency requirements which the candidate must meet. The background of the candidate, and his or her current and prospective research interests, are taken into consideration. The committee also establishes that portion of the formal coursework or particular proficiencies (such as ability to read certain modern foreign languages) which will be demanded of the student before admission to the comprehensive examination. In this examination the candidate is expected to demonstrate knowledge of the fundamentals of zoology and mastery of one or two specialized fields. Usually the student has demonstrated some ability in research through the M.S. thesis, or through equivalent research work. In his or her research, which culminates in the doctoral dissertation, all of the requirements for a scholarly piece of work will be demanded. The acceptance of the thesis by the Department will be followed by the final oral examination over the thesis itself and the specialized field which it represents.

Graduate Student Awards and Aids

Nearly all of the graduate students in the Department receive some support, the largest number from teaching assistantships, scholarships and research assistantships provided by the University or by individual research grants administered by faculty members.

Stipends and full tuition are available in federally-funded developmental biology, cell and molecular biology, and neurobiology training programs administered by the Department. Two of these programs support postdoctoral fellows. Support through interdisciplinary programs in genetics (predoctoral) and cancer (postdoctoral) is also available.

The Department also participates in the University-sponsored program of teaching-research fellowships. Students who apply for any departmental award may be considered for others, if the reviewing committee considers them eligible. The Department provides some support each summer for students who arrange for training at marine laboratories on the coasts, or at other appropriate summer stations. Most assistantship and other appointments for the following academic year are filled by April 1, but opportunities occasionally exist for appointments at other times, including the beginning of the second semester. Requests for appointment should include clear statements of research interest, if such interest has been defined at the time of application.

Orientation

Prior to registration in August, all new graduate students take a diagnostic examination covering topics in developmental biology, genetics, physiology with an emphasis on cell physiology, evolution and ecology. On the basis of examination results, students may be excused from further work in one or all of these fields, or required to take specific courses to enhance their background in the area. These requirements are made to ensure breadth of background for specialized graduate work. Any deficiencies in mathematics, chemistry or physics are to be made up during the first year. Applicants with a degree other than biology or zoology may request modification of certain of the area requirements; this is the province of the student's degree committee.

Admission

An applicant for graduate admission should have a grade-point average above 3.0 and a Graduate Record Examination Aptitude (Verbal and Quantitative) score above 1300. The GRE Advanced Biology score should also be submitted. Although the Department prefers applicants who have completed undergraduate programs much like its own, it will consider applicants with other backgrounds, such as biophysics, botany, biochemistry and other related areas.

Special Facilities

The Department is housed in a cluster of contiguous buildings, with additions completed in 1965 and 1971 more than doubling previously available research space, nearly doubling teaching space and permitting enlargement of the departmental library.

Many of the laboratory courses in the Department depend heavily upon the availability of living animals, and the Department is provided with animal-care facilities for mammals, birds, reptiles, amphibians, fishes, insects and other invertebrates, including protozoa. Special facilities exist for research with viruses, fruit flies and marine organisms. At least 12 walk-in and reach-in environmental chambers are provided for special culture or animal care needs.

There are four transmission electron microscopes, including one for teaching and student research purposes, and one with high resolution capabilities. The Department

also houses the scanning electron microscope facility of the University.

The Department is equipped to carry out research in all areas in which graduate teaching is conducted. Light microscopes of a variety of types are available, including those with phase contrast and polarizing capacities, and those with Nomarski optics. Centrifuges of various sorts, including refrigerated, high-speed, and ultra-high-speed models, are available.

Other special equipment includes electrophoresis and chromatography apparatus; electron amplifying and recording equipment for neurophysiological studies; a PDP-12 computer, a Wang calculator, and other desk-top computers; gas-flow and liquid scintillation counters for radioisotope detection and analysis, including a gas-flow chromotogram scanner and a gas-flow counter; constant temperature bath units of various types for metabolism and growth studies; ovens and incubators; recording UV and visible spectrophotometers; densitometers; Coulter counters; instruments and a field vehicle for fieldwork in physical ecology; water tables, aquaria, and "instant ocean"; micromanipulators; tissue culture rooms and hoods, and cold rooms. Laboratories are otherwise equipped for advanced work which calls for specialized biochemical, biophysical, cytological or serological techniques.

Iowa Lakeside Laboratory

Courses in field biology and aquatic biology extend the on-campus work in ecology. See "Lakeside Laboratory."

Special Faculty Strengths

A Biological Sciences Development Award from the National Science Foundation has ensured that each faculty member has sufficient research space for personal needs and for the needs of the graduate students carrying out thesis research. Each faculty member carries on an active research program; the breadth and variety of these can be deduced from the breadth and variety of advanced courses and seminars offered.

Courses

Primarily for Undergraduates

(Usually the courses numbered 37:7 through 37:81 may not be counted toward the zoology major.)

37:3 Principles of Animal Biology **5 s.h.**
Forms of living organization, metabolism, self-regulation, reproduction, development, genetics, ecology, evolution. Introductory college chemistry (4:13-14 or 4:7-8) strongly recommended. Should be taken by transfer students who have not had an advanced course in zoology. Prerequisite for all courses in the Department numbered 37:103 and above.

37:7 Topics in Biology **1 s.h.**
Informal lectures and discussion; enrollment limited to seven students per section; semester topic chosen by section instructor. Primarily for prospective majors. Prerequisites: 37:3 and consent of course coordinator.

37:21 Principles of Evolution **2 s.h.**
Nature, examples, and mechanisms of evolution. Primarily for nonscience majors.

37:32 Field Studies: Fresh Water and Marine Biology **2 s.h.**

37:40 Brain, Behavior and Evolution **2 s.h.**
A course for nonscience majors reviewing our current knowledge of how the interplay between the nervous system and the environment produces behavioral acts. Examples are drawn from throughout the animal kingdom to illustrate fundamental processes and their evolutionary trends. No prerequisites.

37:49 Introduction to Animal Behavior **3 s.h.**
Survey of principles and concepts in animal behavior and their implications for humans. Intended for nonmajors; majors by permission. Prerequisite: a course in biology or psychology.

37:81 Principles of Human Genetics **4 s.h.**
Heredity in human families and populations; genetic basis of normal and abnormal traits; chromosome behavior; sex determination. Lectures and discussions. Prerequisite: introductory course in biology.

For Undergraduates and Graduates

37:101 Embryology **4 s.h.**
Lectures, readings, laboratory on germ cell maturation, fertilization, early development, organogenesis, and physiological adaptations of fetuses and larvae—with emphasis on vertebrates.

37:103 Comparative Vertebrate Anatomy **4 s.h.**
Structure, function and evolution of vertebrates. Lectures, demonstrations, laboratory. Prerequisite: 37:3 or equivalent.

37:104 Introduction to Developmental Biology **3 s.h.**
Lecture survey of fundamental mechanisms involved in differentiation, organogenesis, morphogenesis; mechanistic approach at the molecular, cellular, and tissue levels of organizations. Prerequisites: 37:3, 4:14.

37:105 Cell Physiology **4 s.h.**
Functions common to all cells: proteins and catalysis, cellular energetics, synthesis of macromolecules, expression of genetic information, control of metabolism, cell cycle, membranes and transport, excitation, movement. Lectures, laboratory, and discussion. Prerequisite: 37:128 or 37:109, 99:120 (may be corequisite), 22M:25 or 22M:16, 29:18 or 29:12, or consent of instructor.

37:106 Developmental Biology Laboratory **2 s.h.**
First-hand introduction to experimental approaches in developmental biology; covers a variety of developing systems and a variety of experimental approaches. Prerequisite: 37:104.

37:107 Invertebrate Zoology **4 s.h.**
Anatomy, physiology, evolution, behavior of protozoa, radiata and protostomatous invertebrates ("worm" phyla, molluscs, arthropods). Prerequisite: 37:3 or equivalent.

37:108 Vertebrate Zoology **4 s.h.**
Zoogeography and systematics; evolution and adaptive radiation of the vertebrates; physiological, anatomical, behavioral, and life history adaptations; vertebrate social systems. Prerequisite: 37:3.

37:109 Genetics **3 s.h.**
Structure, behavior, function of hereditary material. Optional for nonmajors. Prerequisite: 2:1, 37:3 or equivalent. Same as 2:102.

37:110 Genetics Laboratory **1 s.h.**
Emphasizes living plants and animals. Complements 37:109. Same as 2:103.

37:112 Cell, Tissue and Organ Biology **5 s.h.**
Lectures and laboratory dealing with microscopic structure in relation to function in cells, tissues and organs of various animals; emphasis on human or mammal. Prerequisite: 37:3 or equivalent.

37:118 Parasitology **4 s.h.**
Morphology, physiology and general importance of parasites of humans and animals; laboratory primarily experimental; emphasis on host-parasite relationship. Prerequisite: 37:3 or equivalent.

37:124 Comparative Physiology **2-4 s.h.**
Designed as an initial lecture and laboratory experience in physiology; emphasis on arriving at general principles of physiological organization by a comparative approach employing examples from both invertebrate and vertebrate species; additional themes emphasize the relationship of structure and function and the principles of adaptation as illustrated by examining the organism/environment interface. Prerequisite: 37:3, college physics, or consent of instructor.

37:125 A Planet in Crisis **2 s.h.**
Critical review, scientifically based, of imbalance of earth's resources and human population; includes basic ecology, population, resources and pollution; lecture, discussion and reading for general upperclass students. Not open to graduate science majors. Same as 12:125.

37:126 Comparative Physiology Laboratory **1 s.h.**

37:128 Fundamental Genetics **3 s.h.**
Nature and function of genetic mechanism: classical, molecular, developmental, population and evolutionary aspects. Prerequisites: 37:3 or equivalent, 4:13 and 4:14 or equivalent; 4:121 recommended. Same as 2:128.

37:129 Fundamental Genetics Laboratory **1-2 s.h.**
Complements 37:128. Experiments with Drosophila and bacteriophages illustrate major genetic principles. For zoology majors and others with appropriate interest. Prerequisite or corequisite: 37:128. Same as 2:129.

37:131 Evolution **4 s.h.**
Nature, mechanism, and analysis of evolution, with a broad array of biological examples; phylogeny, clocks, adaptation, selection, genetics, macromolecules. Prerequisite: 37:3 or 2:1, 4:121 and several courses in biology recommended. Same as 2:131.

37:132 Ecology **2, 4 s.h.**
Ecology of organisms; adaptations to physical and biological environments; competition; predation; life history strategies; structures and dynamics of populations; interacting populations; communities and ecosystems.

Prerequisites: introductory course in biology, botany or zoology, and 22M:20 or equivalent. Same as 2:132.

37:133 Topics in Ecology 3 s.h.
Topics in population and community ecology; emphasis on quantitative and experimental methods. Lectures, problem sets and critical analysis of selected readings. Recommended: elementary calculus, such as 22M:16 and basic statistics, such as 22S:120. Prerequisite: 37:132 or equivalent.

37:135 Quantitative Field Ecology 5 s.h.
Emphasis on formulating and testing hypotheses under field conditions. Course consists of eight full-weekend field trips to different habitats in Iowa, Tennessee, Michigan. Prerequisites: 37:132 or equivalent, elementary statistics, written permission of the instructor.

37:137 Adaptation and Natural Selection 4 s.h.
Analysis of patterns of adaptation using the comparative method. Topics include evolution of sex, sex ratio, breeding systems, life histories; sociobiology; selection and population phenomena; coevolution. Prerequisite: 37:131, 37:132, or equivalent; or population genetics.

37:143 Comparative Animal Behavior 3 s.h.
Lectures, discussions, readings on aspects of animal behavior, including rhythms, migration, aggression, reproductive and social behavior, ethology. Prerequisite: a course in ecology or physiology, or consent of instructor.

37:144 Comparative Animal Behavior Laboratory 2 s.h.
Prerequisite or corequisite: 37:143.

37:150 Introductory Endocrinology 2 s.h.
Survey of glands of internal secretion; emphasis on vertebrate systems; actions of hormones in regulating growth and metabolism, organ to subcellular levels. Prerequisite: 37:3; organic chemistry recommended.

37:152 Endocrinology Laboratory 2 s.h.
Open only to juniors and above unless space available. Prerequisites or corequisites: 37:150 and consent of instructor.

37:156 Scanning Electron Microscopy 2 s.h.
Electron optics, electron source, vacuum systems, electron beam-specimen interaction, image process, specimen preparation techniques, depth of field, resolution, photography, stereo-pairs, scanning transmission mode, X-ray microanalysis, cathodoluminescence, troubleshooting. Prerequisite: consent of instructor. Same as 12:156, 2:156, 60:274.

37:162 Population and Evolutionary Genetics 3 s.h.
Genetic structure of species, causes of phenotypic variation, mechanisms of evolution; properties of populations, environmental influences, adaptation; theory, investigative methods, findings. Prerequisite: 37:128 or equivalent.

37:163 Behavioral Genetics 3 s.h.
Behavioral and genetic techniques employed in study of inheritance of behavior characteristics; human and animal studies; emphasis on quantitative studies of animal behavior. Prerequisite: consent of instructor.

37:165 Quantitative Genetics 3 s.h.
Principles of quantitative genetics presented in detail; emphasis placed on parameter estimation and artificial selection. Prerequisites: 37:81, 37:128, or equivalent, and consent of instructor.

37:169 Quantitative Methods in Biology 3 s.h.
Application of statistical methods to biological data; data description and presentation, simple hypothesis testing, analysis of variance and linear models, using computer applications where possible. Prerequisite: consent of instructor.

37:171 Molecular Genetics 4 s.h.
Biosynthesis of RNA, DNA, and protein, with emphasis on dependence of these phenomena on genetic information; regulation of these biosynthetic processes; primary emphasis on procaryotic systems, but relevance to eukaryotes also considered. Prerequisite: fundamental genetics (very strongly recommended), biochemistry, or consent of instructor. Same as 99:131.

37:172 Topics in Molecular Genetics 2 s.h.
Areas of particular current interest chosen for detailed study, e.g., DNA replication (1973), restriction enzymes (1974), transcription in procaryotes and eukaryotes (1975); topics related to general mechanisms for control of RNA, DNA and protein synthesis. Prerequisite: 37:171 or consent of instructor.

37:173 Molecular Genetics Laboratory 1-2 s.h.
Phage and bacterial genetics; intracellular synthesis of macromolecules; molecular techniques. Complements 37:171. Corequisite: 37:171 or consent of instructor.

37:174 Biology of the Eukaryotic Cell 2 s.h.
A single developmental system will be studied in toto; system selected is the cellular slime mold, *Dictyostelium discoideum*; reviews entire literature spanning the very detailed molecular biology of the system to the more complex level of cell-cell interactions.

37:175 Topics in Evolutionary Genetics 1-2 s.h.
Weekly reports and discussion of research and thought on a topic, different each year, of major interest. May be repeated for credit. Prerequisite: 37:162 or consent of instructor.

37:176 Topics in Eukaryotic Molecular Biology 2 s.h.
Topic of current research interest considered in detail. Prerequisite: consent of instructor.

37:177 Insect Reproduction and Development 2 s.h.
Lectures, reports and discussions on gametogenesis, embryogenesis and metamorphosis, emphasis depending on interest of participants. Prerequisite: consent of instructor.

37:178 Advanced Genetics 4 s.h.
Same as 2:178, 61:178, 99:178.

37:179 Advanced Developmental Biology 2 s.h.
Selected topics related to cell differentiation and morphogenesis; molecular mechanisms in cytodifferentiation, the phenotype of the cancer cell, differentiation and morphogenesis in simple systems, transcriptional and translational control. Students trained to critique original research papers in developmental biology. Prerequisite: 37:104, 37:109, or 37:128.

37:180 Introduction to the Neurosciences 3 s.h.
Attempts to understand the functioning of nervous systems at the molecular and cellular levels and up to such expressions of brain activity as subjective experiences; experimental approaches of different disciplines and their contributions to this field; including neurophysiology, molecular neurobiology, neuroanatomy, developmental neurobiology. Prerequisite: 37:3.

37:181 Fundamentals of Neurophysiology 3 s.h.
Detailed discussions of physiological properties of nerve cells which enable them to form functioning nervous systems; axonal conduction, synaptic transmission, sensory transduction, integrative processes, and effector mechanisms including muscular and secretory processes. Prerequisites: 37:180, 29:12.

37:182 Molecular Neurobiology 2 s.h.
Such neuronal characteristics as axonal conduction, sensitivity to chemical transmitters, and intercellular recognition in terms of the properties of membrane macromolecules; emphasis on recent advances in membrane biochemistry and their application to neurobiological problems. Prerequisites: 37:180 and a biochemistry course.

37:183 The Synapse 2 s.h.
Discussions of current research on anatomical, biochemical, and electrophysiological properties of synapses, including alterations of these properties by genetic or environmental manipulation. Prerequisite: 37:181 or 37:182 or consent of instructor.

37:184 Seminar in Neurophysiology 2 s.h.
Reports on selected topics of current interest in neurophysiology. Prerequisite: consent of instructor.

37:185 Techniques in Neurobiology 4-6 s.h.
Direct laboratory experience in electrophysiological, anatomical, and biochemical techniques essential for the study of the nervous system. Prerequisites: 37:181, 37:182, and consent of instructor.

37:186 Advanced Neurophysiology 2 s.h.
Classical experiments in neurobiology presented as background material for the laboratory work in 37:185, which may be taken at the same time. Prerequisite: 37:181 and 37:182.

37:187 Lectures on Faculty Research 0-1 s.h.
All incoming graduate students required to attend; undergraduate seniors and other graduate students may also attend.

37:189 Neuroembryology 1 s.h.
Lectures, discussions, readings, reports on development of nervous system and sense organs, development of behavior, nerve growth and regeneration. Prerequisite: 37:104, 37:180 or consent of instructor.

37:190 Seminar: Cell Structure and Function 2 s.h.
Lectures, readings, and reports covering current literature in organelle structure and function; detailed organization and composition of biological membranes and their diversity in relation to cell function constitute a central theme of investigation.

37:191 Virus Assembly and Cell Organelle Development 3 s.h.
Review of literature with emphasis on current problems; major topics will include the assembly of tobacco mosaic virus, bacteriophage T4, bacterial flagella, microtubules, membranes, ribosomes. Prerequisite: coursework beyond 37:3, with some emphasis in biochemistry or genetics.

37:193 Biology of the Cancer Cell 2 s.h.
Phenotype of the neoplastic cell. Prerequisites: 37:104 and 37:109, or consent of instructor.

37:194 Topics in Developmental Biology 2 s.h.
Readings, reports and discussions of selected topics in developmental biology with special current interest. Prerequisite: 37:104 or consent of instructor.

37:195 Pattern Formation in Development 3 s.h.
Problems of positioning of parts and development of pattern in both multicellular and unicellular organisms. Prerequisite: consent of instructor.

37:196 Honors Laboratory Research 1-3 s.h.
For Honors candidates.

37:197 Honors Readings in Zoology 1-3 s.h.
For Honors candidates.

37:198 Honors Seminar in Zoology 1-2 s.h.
Discussions and readings centered on either single major topic or on regular lecture series of 37:217. May be repeated.

37:199 Introduction to Research arr.
For senior majors in zoology. Prerequisite: consent of instructor.

Courses Primarily for Graduates

37:205 Molecular Embryology Seminar **0-1 s.h.**
Readings, reports, discussions on topics of current interest, with implications for fields of genetics and development. May be repeated. Prerequisite: consent of instructor.

37:207 Cell and Molecular Development **0 s.h.**
Informal discussion of topics of current interest in developmental biology. Prerequisite: consent of instructor.

37:215 Genetics Seminar **0-2 s.h.**
Lectures, discussions, seminars on selected topics in genetics. May be repeated. Prerequisite: 37:126 or consent of instructor. Same as 61:215, 2:215, 99:215.

37:217 Seminar: Zoology **0-1 s.h.**
Weekly lecture on current research; invited speakers.

37:218 Introduction to Electron Optical Research Techniques **arr.**
Lecture and laboratory on methods of tissue fixation, embedding, ultra-thin sectioning and staining; theory, use, maintenance of electron microscope; associated photographic techniques. Prerequisites: 37:112 and consent of instructor. Same as 2:218, 60:218, 61:218, 99:218.

37:225 Seminar: Endocrinology **2 s.h.**
Selected topics of current research interest in basic physiology and biochemistry of hormone action. Prerequisite: 37:150 or equivalent.

37:226 Seminar: Hormones and Behavior **2 s.h.**
Discussions, readings and reports on topics concerning neural and hormonal regulation of behavior. Prerequisite: 37:143, 37:150, or equivalent in physiology and behavior.

37:233 Seminar: Theoretical Ecology **2 s.h.**
Current concepts in ecology. Prerequisites: 37:133 or consent of instructor.

37:235 Advanced Techniques in Light Microscopy **2 s.h.**
Theory of modern techniques in light microscopy, with some demonstrations, including bright field, dark field, phase contrast, Nomarski, fluorescence.

37:237 Seminar: Evolution **2 s.h.**
Discussions, readings in current evolutionary theories.

37:240 Ecological Research, Analysis, and Writing **2 s.h.**
May include experimental design, hypothesis testing, sampling methods, data analysis, simple modeling, and scientific writing; participants may be asked to analyze and criticize ecological literature, work problems, or write a scientific paper or thesis proposal. Prerequisites: graduate status and consent of instructor.

37:243 Seminar: Behavioral Ecology **2 s.h.**
Discussions, readings, reports on topics relating to interactions between behavior and ecology in populations and ecosystems. Prerequisites: course each in ecology and behavior, or consent of instructor.

37:260 Developmental Genetics **2 s.h.**
Lectures, readings, discussions on gene action in development. Prerequisite: 37:126 or equivalent.

37:263 Seminar: Behavioral Genetics **1 s.h.**
Prerequisite: 37:163.

37:265 Neurobehavioral Sciences Seminar **0-1 s.h.**
Open student-faculty discussion of current literature in research areas bearing on neurosciences and behavior. Same as 60:265, 72:265.

37:271 Seminar: Cell Physiology **2 s.h.**
Current topics in physiology studied by critical reading of the scientific literature. May be repeated for credit. Prerequisite: 37:105 or consent of instructor.

37:272 Seminar in Cellular and Molecular Biology **1 s.h.**
Information transfer and regulation, assembly and developmental processes, membranes and transport. For students in Cellular and Molecular Biology Research Training Program and others interested, with consent of the instructor. May be repeated for credit. Same as 60:272, 61:272, 71:272, 72:272, 99:272.

37:281 Seminar in Neurobiology **1 s.h.**
Presentations of current literature. Prerequisite: consent of instructor.

37:282 Readings in Synaptic Transmission **2 s.h.**
Current research on the biochemistry, anatomy and physiology of neuronal transmission in invertebrates and vertebrates. Prerequisites: 37:105, 37:124, and introductory course in chemistry, or consent of instructor.

37:284 Advanced Techniques in the Neurosciences **1 s.h.**
Interdisciplinary and interdepartmental course presenting neurobiological techniques used by different laboratory groups throughout the University. Prerequisite: consent of instructor. Same as 31:284, 60:284, 71:284, 72:284, 99:284.

37:298 Advanced Electron Microscopic Techniques **4 s.h.**
Continuation of 37:218, but emphasizes experimental aspects of electron microscopy, including negative staining, shadow casting, cytochemical and autoradiographic applications. Prerequisites: 37:218, biochemistry and consent of instructor.

37:299 Problems in College Biology Instruction **1 s.h.**
Discussion of theoretical and practical problems. Restricted to graduate students.

37:301 Research: Zoology **arr.**

37:303 Independent Study in Zoology **arr.**

College of Business Administration

Dean: J. Richard Zecher
Associate dean: Hadley P. Schaefer
Assistant dean: Ernest V. Zuber
Degrees offered: B.B.A., M.B.A., M.A., Ph.D.

The College is organized into four academic departments: Accounting, Business Administration, Economics and, jointly with the College of Education, the Department of Business Education.

The undergraduate and graduate programs of the College are fully accredited by the American Assembly of Collegiate Schools of Business.

Research and executive development activities are supported by the Center for Labor and Management, Institute for Insurance Education and Research, Institute for Economic Research, and Industrial Relations Institute.

Undergraduate Study

The College offers the Bachelor of Business Administration degree in all four departments. The B.B.A. student completes background studies either in the College of Liberal Arts at Iowa or in another institution and usually enters the College of Business Administration as a junior.

Program Requirements

To assure educational breadth and to permit limited specialization at the baccalaureate level, Iowa's B.B.A. curriculum requires 120 semester hours for graduation, with at least 48 hours in business courses and at least 48 hours in nonbusiness courses. Limited specialization is effected through the student's option of a designated major or areas of concentration.

The last 30 (or 45 of the last 60) semester hours must be earned in residence at Iowa following admission to the College of Business Administration; at least 24 semester hours of credit in courses offered by the College of Business Administration, and at least eight semester hours of credit in the student's major or six semester hours in each area of concentration, must be earned at Iowa.

A student who has not satisfied the quantitative methods, psychology/sociology, accounting and economics requirements when admitted to the College must undertake them in the first enrollment and continue until successfully completed. In general, students should complete all common requirements by the end of the junior year.

To graduate, the B.B.A. candidate must have at least a 2.0 grade-point average on all coursework, on all coursework attempted at Iowa, on all business and economics coursework attempted, on all business and economics coursework attempted at Iowa, on all coursework attempted in the major or area of concentration, and on all coursework attempted at Iowa in the major or area of concentration.

Common Requirements

The B.B.A. candidate must satisfy these minimum common requirements:

*Rhetoric-communications	6 s.h.
*Historical-cultural	6 s.h.
Literature	6 s.h.
*Natural sciences (excluding mathematics)	3 s.h.
*Psychology or sociology	6 s.h.
*Quantitative methods	8 s.h.
6A:1 Introduction to Financial Accounting	3 s.h.
6A:2 Introduction to Managerial Accounting	3 s.h.
6E:1 Principles of Economics	4 s.h.
6E:2 Principles of Economics	4 s.h.
6B:15 Financial Management	3 s.h.
6B:31 Introduction to Marketing	3 s.h.
6B:47 Introduction to Law	3 s.h.
6B:61 Administrative Management	3 s.h.
6B:72 Computer Analysis	3 s.h.
Required course in business policy	1 s.h.

*Consult the college's undergraduate office concerning required and alternative methods for meeting the requirements listed above.

In addition, the student must complete a major area of study or two areas of concentration. The requirements for a specific major are established by the departments of the college.

An area of concentration consists of a combination of related courses, selected by the student and approved by the adviser, which are designed to meet a specific academic or career objective. Final approval

will be made by the assistant dean's office. Each area must consist of at least three courses (9 s.h.), and two courses in each area must be offered by the College of Business Administration.

Credit by Examination

Students may earn up to 32 semester hours of credit by examination. Selected tests from the College-Level Examination Program (CLEP) of the College Entrance Examination Board are used. It is possible to receive exemption with or without credit for some of the common requirements of the College. Information on the CLEP examinations is available from the Liberal Arts Advisory Office.

Maximum Schedule

Course schedules of more than 18 semester hours for a semester or nine for a summer session require approval of the assistant dean.

Pass/Fail Grading

Of the total semester hours required for a B.B.A. degree, up to 32 may be taken on a pass/fail basis with the consent of the adviser and instructor. However, a student may not count more than 16 semester hours of pass/fail credit in his or her last 60 semester hours of coursework. Courses with the 6A, 6B or 6E prefix which are taken to satisfy the common business requirements may not be taken pass/fail, nor may courses in the student's major area or areas of concentration. Pass/fail registration must be completed during the first three weeks of a semester or the first two weeks of a summer session. For courses taken on a pass/fail basis, an earned grade of C or above is recorded as a P; otherwise, the grade earned (D or F) is recorded.

Second-Grade-Only Option

Unless obvious regression is involved and with permission of the assistant dean, a student may be permitted to repeat a University course and have only the grade and credit of the second registration used in calculating his or her cumulative grade-point average. This option may be applied to a maximum of 16 semester hours of work.

Admission

Admission is normally at the beginning of the junior year. Second-semester sophomores may be admitted if an accelerated program record has been established. Unconditional admission requires at least a 2.25 grade-point average (A=4) in all college-level courses undertaken, including all courses undertaken at Iowa and all business and economics courses. The applicant should also have satisfied the following common requirements: rhetoric-communication, psychology/sociology, quantitative methods, accounting and economics, and either historical-cultural or literature.

No more than 60 semester hours, or equivalent, of transfer credit will be accepted for a student transferring from a two-year institution. Transfer credits for business and economics courses taken during the freshman and sophomore years are counted toward the B.B.A. degree only if such courses are normally offered as lower division courses at Iowa.

Fulfillment of the minimum requirements does not ensure admission. The College's admission committee reviews all applications and selects the applicants who appear best qualified. Students who have minor deficiencies in meeting admission requirements may be granted conditional or probationary admission.

Interdepartmental Graduate Programs

Master of Business Administration

The Master of Business Administration (M.B.A.) program is designed for individuals preparing for professional administrative careers in the business or public sector. The program gives the individual a means of enhancing career opportunities and at the same time provides industry and government with the professional personnel required in a dynamic economy.

The curriculum is designed for candidates whose undergraduate majors were in liberal arts, science, engineering or other nonbusiness areas, as well as for graduates of schools or colleges of business administration. For the student who has taken no prior business administration courses, 57 semester hours of coursework are required. For the student with prior coursework in business administration, certain of the foundation courses may be waived. However, in all cases, a minimum of 33 semester hours of graduate work is required. The following foundation courses, totaling 24 semester hours, may be waived on the basis of exemption examinations or equivalent coursework of high quality:

6A:192 Financial Accounting	3 s.h.
6B:193 Computer Methods—M.B.A.	2 s.h.
6B:194 Managerial Finance—M.B.A.	2 s.h.
6B:195 Management of Organizations—M.B.A.	3 s.h.
6B:196 Marketing Management—M.B.A.	2 s.h.
6B:197 Quantitative Methods—M.B.A.	3 s.h.
6B:198 Society, Law and Business—M.B.A.	2 s.h.
6E:100 Price, Employment and Production Theory	3 s.h.
6E:190 Consumer and Firm Behavior	2 s.h.
6E:191 National Income Analysis	2 s.h.

In the M.B.A. core, the student has the opportunity to continue the broad study begun in the sequences of courses listed above and pursues in greater depth the special interests associated with his or her own career objectives. In addition to courses required of all students, each individual decides upon an area of concentration and, with the assistance of the M.B.A. adviser, selects at least six semester hours of coursework in that area.

The following are the core course requirements, totaling 33 semester hours:

Integrated Core (18 s.h.):

6A:214 Managerial Accounting—M.B.A.	3 s.h.
6B:261 Administrative Science I—M.B.A.	3 s.h.
6B:265 Administrative Policy—M.B.A.	3 s.h.
6B:271 Statistical Methods—M.B.A.	3 s.h.
6B:273 Managerial Economic Theory—M.B.A.	3 s.h.
6B:276 Operations Research in Business—M.B.A.	3 s.h.

Applied Core (9 s.h.):

Three of the following, or two of the following and an approved elective:

6B:215 Financial Policy Decisions—M.B.A.	3 s.h.

6B:232 Marketing Management II—M.B.A.	3 s.h.
6B:256 Industrial Relations—M.B.A.	3 s.h.
6B:280 Management Systems—M.B.A.	3 s.h.
Area of Concentration	6 s.h.

Doctor of Philosophy in Business Administration

The Ph.D. program is intended for individuals preparing for faculty positions in university or collegiate schools of business administration and for business or government careers as research directors, staff specialists and consultants. The program is sufficiently flexible to accommodate specialization according to the student's interests, background and objectives.

Foundation Areas

The purpose of the foundation areas is to develop competency in research methods and to provide the background needed for study in any sequence of more specialized courses. The student should complete the requirements in the foundation areas before proceeding to the specialized areas. The requirements in the foundation areas may be satisfied by passing a qualifying examination or by successfully completing each course. The Ph.D.-level courses required are:

Economic Theory

6E:203 Microeconomics I	3 s.h.
6E:204 Macroeconomics I	3 s.h.

Statistics and Quantitative Analysis

6B:286 Statistics for Decision Making I—Ph.D.	3 s.h.
6B:287 Statistics for Decision Making II—Ph.D.	3 s.h.
6B:288 Management Science for Decision Making—Ph.D.	3 s.h.

Behavioral Sciences

6B:266 Behavioral Science and Business Organization I	3 s.h.

Research Methods

One or more courses recommended and approved by the adviser.

The student is also required to satisfy the common body of knowledge requirement of the American Assembly of Collegiate Schools of Business (AACSB). This means the candidate's undergraduate or graduate coursework should include study in the following areas: accounting, quantitative methods, organizational behavior, management, finance, marketing, and the economic and legal environment pertaining to profit and/or nonprofit organizations.

Specialized Areas

Preparation for dissertation research begins with the student selecting two specialized areas of study. One or both may be from the foundation areas and one may be from outside the College. Typical areas include accounting, finance, marketing, management science, insurance, industrial relations, administrative studies, and other business-related disciplines. Four graduate-level courses are normally required in each area.

The student must pass written comprehensive examinations in both areas. Each examination assumes that the student has completed requirements which provide a mastery over the field which is being examined. Upon completion of the written examinations, the student must pass an oral comprehensive examination.

The Dissertation

Completion of the research and writing associated with the dissertation normally requires one year of full-time effort. Upon completion the candidate must defend the dissertation in an oral examination.

Graduate Admission

See "Graduate College."

Facilities

The College of Business Administration is located in Phillips Hall, an air-conditioned high-rise building designed especially for programs of the College. The building contains seminar and conference rooms, a computer laboratory, an auditorium, and the Business and Economics library, in addition to a wide range of classroom facilities.

Extensive research materials for business and economics are maintained in the Main Library, and the facilities of the University Computer Center are available to all students. Additionally, students have direct access to a complete computer laboratory within the College. The laboratory serves the instructional programs of the College, and the staff maintains a current library of computational programs and data tapes to service user needs.

Center for Labor and Management

As a major continuing education arm of the College, the Center for Labor and Management provides relevant information to management, labor and government representatives in Iowa and the Midwest. Current industrial relations and administrative knowledge is disseminated through on- and off-campus conferences and through a research-oriented publication series. Organizational research and development projects give students experience in research and teaching as well as the opportunity to discuss current societal problems with private and public sector labor and management officials.

The Institute for Insurance Education and Research

The Institute for Insurance Education and Research is the College's continuing education arm in the field of insurance. The Institute conducts schools and seminars throughout the year at the University of Iowa campus in Iowa City and at other locations across the country. It also engages in contract research related to insurance for public and private organizations.

The Institute for Economic Research

The Institute for Economic Research exists in order to facilitate cohesive and continuing economic research and to establish a formal mechanism for providing interaction with and economic advice to industry and government. The main objectives associated with the Institute are: to provide economic information, service and advice on a continuous basis to business and to public agencies; to provide a state focal point for applied economic research; and to promote and enhance academic research and teaching in economics.

The Industrial Relations Institute

The Industrial Relations Institute is designed to bring faculty and students together with interests in industrial relations for the purposes of curriculum matters and research, and to conduct continuing education seminars and workshops for practitioners in the field of industrial relations. Faculty associated with the Institute are drawn from the departments of Business Administration and Economics and from the Center for Labor and Management.

Accounting

Department chair: B.L. Barnes
Faculty: *professors* B.L. Barnes, William R. Kinney, Jr. (Murray Professor), Hadley Schaefer, John H. Smith *associate professors* Valdean C. Lembke, Gerald Salamon, Wilfred Uecker
assistant professors Lawrence Brown, Robert Capettini, Dan C. Dhaliwal, Richard Grimlund, Albert Schepanski
Degrees offered: B.B.A., M.A.

The function of accounting is to provide information to decision-makers. It is essential that accountants be able to express their thoughts in an orderly, logical manner, in words as well as in figures, and that they be able to relate well to their associates and to customers or clients. Success in professional accounting also requires the ability to recognize the merits of new ideas and apply them to the improvement of current practice.

The Professional Program in Accounting at Iowa is a two-year program of study which develops the technical proficiency and the conceptual, analytical, and communication skills necessary to succeed in the accounting profession. The program prepares candidates for careers in all areas of accounting, including the necessary educational qualifications for professional examinations such as the CPA, CMA, and CIA.

Students ordinarily enter the Professional Program in Accounting after three years of preprofessional work which emphasizes business and the liberal arts, and which satisfies the general education requirements of the University and the College of Business Administration.

The program is also open to students with undergraduate degrees. The degree need not be in a business major; graduates of the program have included, for example, students with bachelor's degrees in history and engineering.

Accounting Programs

A flexible two-year program is available to both graduates and undergraduates.

Plan 1 (for the B.B.A. student)

As a candidate for the B.B.A. with a major in accounting, a student in the College of Business Administration may enter the Professional Program in Accounting after completing 90 semester hours of coursework, including the common requirements for the B.B.A., 6B:70 Quantitative Analysis and 6B:71 Statistical Analysis.

First Year

**6A:115 Introduction to Taxation	3 s.h.
6A:130 Cost Accounting for Management Analysis and Control	3 s.h.
*6A:131 Financial Accounting I	3 s.h.
6A:132 Financial Accounting II	3 s.h.
6A:144 Auditing	3 s.h.
6A:145 Financial Accounting III	3 s.h.
**6E:103 Microeconomics	3 s.h.
6B:148 Law and Business	3 s.h.
**6B:161 Individual Behavior in Organizations	3 s.h.
or	
6B:118 Intermediate Financial Management	4 s.h.
**6B:176 Operations Management	3 s.h.

*Must be completed during the spring semester of the junior year or the following summer.

**May be taken during the junior year.

After completing first-year coursework, the student can receive the B.B.A. in Accounting.

A student entering with a B.B.A. in accounting from another university usually is required to take only the second year of the professional program.

Second Year

6A:220 Accounting Theory I	3 s.h.
6A:221 Accounting Theory II	3 s.h.
Graduate Accounting electives	9-12 s.h.
Graduate electives	12-15 s.h.
6A:250 Accounting Issue Series	0 s.h.

Upon satisfactory completion of the 30-hour requirement for the second year, the student receives the Master of Arts degree in accounting.

Plan 2 (nonbusiness undergraduates)

A student with an undergraduate degree in a field other than business administration can, with careful planning, complete the Professional Program in Accounting requirements in two calendar years. A nonbusiness undergraduate planning to enter the Program should take as many first-year courses as his or her undergraduate degree program permits. First-year courses for the student with no previous accounting or business coursework are:

First Year

6A:1 Introduction to Financial Accounting	3 s.h.
6A:2 Introduction to Managerial Accounting	3 s.h.
6A:115 Introduction to Taxation	3 s.h.
6A:130 Cost Accounting for Management Analysis and Control	3 s.h.
6A:131 Financial Accounting I	3 s.h.
6A:132 Financial Accounting II	3 s.h.
6E:100 Price, Employment, and Production Theory	3 s.h.
6B:193 Computer Methods MBA	2 s.h.
6B:194 Managerial Finance MBA	2 s.h.
6B:195 Management of Organizations MBA	3 s.h.
6B:196 Marketing Management MBA	2 s.h.
6B:197 Quantitative Methods MBA	3 s.h.
6B:271 Statistical Methods MBA	3 s.h.
6B:276 Operations Research in Business MBA	3 s.h.

Second Year

6A:144 Auditing	3 s.h.
6A:220-221 Accounting Theory I-II	6 s.h.
6A:270 Advanced Financial Accounting Problems	3 s.h.
6B:148 Law and Business	3 s.h.
6B:261 Administrative Science I MBA	3 s.h.
6B:273 Managerial Economic Theory MBA	3 s.h.
Graduate Accounting electives	9 s.h.
6A:250 Accounting Issue Series	0 s.h.

After completing the second year of coursework, the student receives the Master of Arts degree in Accounting.

Candidates for the Master of Arts degree in Accounting must maintain a 3.0 grade-point average in all graduate-level accounting courses and must pass an oral comprehen-

sive examination. Candidates may substitute a thesis for three semester hours of graduate accounting electives.

Ph.D. Program

Candidates wishing to earn a Ph.D. degree in accounting should refer to the description of the program leading to Doctor of Philosophy in the College of Business Administration section.

Courses

Primarily for Undergraduates

6A:000 Cooperative Education Training Assignment 0 s.h.

6A:1 Introduction to Financial Accounting 3 s.h.
Survey and analysis of contemporary accounting information systems; emphasis on external reporting by a firm to its investors and creditors. Prerequisite: sophomore standing.

6A:2 Introduction to Managerial Accounting 3 s.h.
Survey and analysis of contemporary accounting information systems; emphasis on preparation of information for management decision-making. Prerequisite: 6A:1.

Primarily for Undergraduates and Graduates

6A:115 Introduction to Taxation 3 s.h.
Introduction to federal income taxation; coverage includes individual, corporate, and partnership income tax laws and regulations; emphasis is on developing a broad perspective of the structure, administration, and rationale of the federal income tax system. Prerequisites: grades of A or B in 6A:1, 6A:2.

6A:120 Financial Accounting Reporting 3 s.h.
Analysis of external accounting reporting practices in the context of decisions by enterprise management, current and potential stockholders, financial analysts, etc.; emphasis on interpretation and use of financial statements. Recommended for students not majoring in accounting who wish to obtain a better understanding of current accounting report practices. Prerequisite: 6A:2 or equivalent.

6A:130 Cost Accounting for Management Analysis and Control 3 s.h.
Selection and preparation of information which will serve to support and assist management in planning and controlling firm's operations; includes cost estimation and reporting, cost-volume-profit analysis, budgeting, variance analysis, cost allocation; quantitative techniques integrated with more traditional approaches. Prerequisites: grades of A or B in 6A:1, 6A:2; senior standing; 6B:70, 6B:71.

6A:131 Financial Accounting I 3 s.h.
First course in a three-course sequence dealing with financial accounting concepts and practice; includes review of income statement and balance sheet accounts, followed by intensive coverage of asset and liability sections of the balance sheet. Prerequisites: grades of A or B in 6A:1, 6A:2.

6A:132 Financial Accounting II 3 s.h.
Second course in a three-course sequence dealing with financial accounting practice; includes stockholder's equity section of the balance sheet, the funds statement, and special problems, such as earnings per share calculations, leases, interim reporting, price level adjustments. Prerequisites: 6A:131, senior standing.

6A:144 Auditing 3 s.h.
Develops an understanding of the audit function as it exists in current business and government operations; audit standards, ethics, and liability; audit evidence including the application of statistics in sampling and analytical review; audit reports and external influences on audit practice. Prerequisites: 6A:130, 6A:132, senior standing.

6A:145 Financial Accounting III 3 s.h.
Third course in a three-course sequence dealing with financial accounting practice; includes business combinations, reorganizations, and consolidations, as well as recent FASB Accounting Standards and Interpretations; specific consideration also given to accounting and reporting procedures in governmental and nonprofit organizations. Prerequisites: 6A:132, senior standing.

6A:170 Special Topics in Accounting arr.
Elective course for senior accounting majors; advanced topics in accounting covered in greater depth; topics selected on basis of student and faculty interest. Multiple sections offered if more than one topic demanded. Prerequisite: consent of instructor.

6A:192 Financial Accounting 3 s.h.
Survey of current practice and thought relating to external reporting by firm to its investors; rationale and criticisms of current external reporting methods and their alternatives. Primarily for students without undergraduate accounting; not open to undergraduate business majors. Prerequisite: senior standing or admission to the Graduate College.

Primarily for Graduates

6A:214 Managerial Accounting MBA 3 s.h.
Internal financial information systems; accounting information surveyed and analyzed in context of management decision systems and models; relevant economics, behavioral sciences, and quantitative analyses employed as basis for assembly and display of accounting data. Not open to accounting majors. Prerequisites: 6A:192, 6B:194. Corequisite: 6B:276.

6A:215 Financial Information for External Users 3 s.h.
Concepts and methods of corporate external reporting; theoretical basis of current reporting practices analyzed in context of investor decision models and alternative accounting methods. Not open to accounting majors. Prerequisite: 6A:192 or equivalent.

6A:220 Accounting Theory I 3 s.h.
First course in a two-course sequence on accounting theory; unifying theme of the theory sequence is optimal choice among accounting alternatives. Focus of Theory I is choice among accounting alternatives in internal reporting; includes decision theory, capital budgeting, variance investigation, and performance measurement. Prerequisite: 6A:130.

6A:221 Accounting Theory II 3 s.h.
Focus of Theory II is optimal choice among accounting alternatives in external reporting. Includes alternative income and asset measurement methods, social choice issues in the selection among alternative accounting methods, implications of efficient capital markets for choice among financial reporting alternatives. Prerequisites: 6A:220 and 6A:145 or 6A:270.

6A:222 Accounting Information Systems 3 s.h.
Evaluation and design of accounting information systems; special emphasis on use and evaluation of information systems by auditors; file design and hardware, software problems which can arise in such applications. Prerequisite: 6B:72.

6A:230 Auditing and Regulation of Accounting Practice 3 s.h.
Focus on auditing as a control function, as well as government regulation and influence on current financial reporting and audit practice; acquaints students with contemporary problems in auditing and with the government agencies which regulate or influence accounting practice. Prerequisite: 6A:144.

6A:231 Research in Taxation 3 s.h.
Current tax practices and preparation for continuing research in taxation; emphasis on controversial areas of taxation. Prerequisite: 6A:115.

6A:232 Contemporary Issues in Accounting 3 s.h.
Specific topics dealing with contemporary accounting issues; selection of materials varies from semester to semester, depending upon instructor's and students' interests. Prerequisite: 6A:221.

6A:233 Controllership 3 s.h.
Designed primarily for the student seeking an accounting career in private industry or government; includes advanced topics in cost estimation, analysis, allocation, control, and regulation. Prerequisite: 6A:130.

6A:240 Empirical Research in Accounting 3 s.h.
Methods of research and their relationships to accounting problems. Consideration given to problem formulation, research design, and research methodology. Each student is expected to complete a research project. Prerequisite: 6A:221.

6A:250 Accounting Issue Series 0 s.h.
Through brief intensive lecture-workshop sessions with accounting practitioners from industry, government, and public accounting, students are exposed to ideas, practices, and problems these practioners face. Normally two workshops fall and spring semesters, four during summer session.

6A:270 Advanced Financial Accounting Problems 3 s.h.
Analysis of advanced financial accounting topics and contemporary problems, such as nonprofit reporting and recent accounting standards. Designed for students who have not completed 6A:145 or do not have a recent accounting degree. Prerequisite: 6A:132.

6A:280 Seminar in Financial Accounting Thought 3 s.h.
Evolution of accounting thought as applied to the current and future development of a conceptual framework of accounting. Specific consideration of the impact of information economics, decision theoretic models, and capital asset pricing models, on financial accounting information system choice. Primarily for doctoral students.

6A:281 Seminar in Managerial Accounting Thought 3 s.h.
General topics include measurement, research concepts, design, and methods for accounting and related areas. Advanced topics in information economics, managerial accounting and systems design, and analysis. Primarily for doctoral students. Continuation of 6A:280.

6A:286 Seminar in Accounting Research arr.
Student-faculty forum for discussion of current research topics in accounting and related disciplines; papers written by faculty, students, and invited guests provide basis for exchange of ideas and criticisms; Ph.D. dissertation proposals in accounting are presented. Primarily for doctoral students.

6A:287 Seminar in Selected Accounting Topics arr.
Individually guided study and research paper preparation in specialized topical areas. Prerequisite: consent of instructor.

6A:290 Thesis: Accounting arr.
Prerequisite: consent of instructor.

Business Administration

Department chair: Eleanor M. Birch
Faculty: *professors* Clifford M. Baumback, John S. Harlow, Charles R. Klasson, Irving Kovarsky, Charles E. Marberry, Peter Schoderbek, Anthony V. Sinicropi, Robert M. Soldofsky, Richard A. Stevenson, Emmett J. Vaughan
professor emeritus Elmer Hills
associate professors E. Norman Bailey, Penny H. Baron, Eleanor M. Birch, Warren J. Boe, David J. Curry, Gerald J. Eskin, Gary Fethke, R. Jagannathan, Edward H. Jennings, E. John Kottman, Michael Murray, Peter C. Riesz, Gerald L. Rose, Michael S. Rozeff, Thomas H. Stone, Gary A. Wicklund
assistant professors Gary Ahrens, Arthur Beard, Arthur P. Brief, Thomas Cook, Richard Corbett, Louis D'Antonio, Daniel Gallagher, Jeffrey Horen, Mark M. Moriarty, Richard C. Pegnetter, Susan M. Phillips, G. Carl Schweser
Degrees offered: B.B.A., M.A.

The Undergraduate Program

The purpose of Iowa's undergraduate program in business administration is to give the student a general overview of business with its position in and relationship to society. The program deals with business theory, decision-making and management systems generally, rather than specializing in a particular facet of business organization. Designed to teach students *about* business rather than *how to conduct* business, the program's behavioral approach stresses the concept of human interaction in business and society at large.

Students graduating with the B.B.A. in business administration have a wide range of career choices. The largest number go into marketing. Many are employed by financial institutions and in junior management positions. Others enter government service and other nonbusiness fields requiring administrative skills. Many continue their studies toward advanced degrees. There is considerable latitude within career areas. For example, the avenues open to a business administration graduate with a major in marketing include advertising and promotion, costing, product development and improvement, and product distribution.

The student of business administration can choose between two options in fulfilling the degree requirements:

In addition to courses specified in the College's general statement, students can select two three-course sequences (usually 9 s.h. each) in areas of concentration approved by a faculty adviser. Two of the courses in each area must be offered by the College of Business Administration.

Or in addition to courses outlined in the general statement, students can elect a major in one of the following areas:

Finance

6B:71 Statistical Analysis
6B:111 Investments
6B:113 Financial Markets and Institutions

At least two semester hours of accounting beyond the basic core are also required, followed by any two of these:

6B:112 Security Analysis
6B:114 Commercial Banking
6B:118 Intermediate Financial Management

Financial Economics

6B:111 Investments
6B:113 Financial Markets and Institutions

6B:173 Managerial Economics
or
6E:103 Microeconomics

These are to be followed by two of these:

6B:114 Commercial Banking
6E:117 Money and Banking
6E:119 Economics of the Government Sector
6E:141 Industrial Organization

Insurance

6B:20 General Insurance
6B:121 Property and Liability Insurance
6B:122 Life and Health Insurance

At least one of the following:
6B:123 Public Economic Security Programs
6B:124 Risk Management

Six additional hours of courses specified by the student's adviser.

Industrial Relations

6B:158 Personnel Management

One of the following:
6B:151 Employment Rights
6B:152 Labor Relations Legislation

One of the following:
6B:153 Collective Bargaining
6B:154 Employee Relations in the Public Sector

One of the following:
6B:155 Manpower Policy and the Development of Human Resources
6E:111 Labor-Manpower Economics
6B:159 Current Issues in Industrial Relations

Any of the eight courses above not previously chosen, or others designated by area faculty.

Administrative Management

6B:158 Personnel Management
6B:161 Individual Behavior in Organizations
6B:162 Group Behavior in Organizations
6B:163 Design and Management of Organizations

One of the following:
6B:168 Managerial Information Processing and Decision Behavior
6B:169 Selected Problems in Administrative Management

Management Systems

6B:71 Statistical Analysis
6B:180 Management Information Systems
6B:181 Topics in Management Information Systems

Two of the following:
6B:168 Managerial Information Processing and Decision Behavior
6B:176 Operations Management
6B:177 Simulation Methods
6B:178 Topics in Operations Management

A programming language course approved by the student's adviser.

Management Science

6B:70 Quantitative Analysis
6B:71 Statistical Analysis

Two of the following:
6B:175 Decision Theory for Business
6B:176 Operations Management
6B:177 Simulation Methods

One of the following:
6B:173 Managerial Economics
6B:178 Topics in Operations Management

Marketing

At least four, but no more than five:
6B:132 Marketing Distribution Systems
6B:134 Marketing Research
6B:135 Consumer Behavior
6B:137 Advertising Theory and Planning
6B:138 Marketing Communications
6B:139 Sales Management
6B:141 Senior Seminar in Marketing
6B:147 Marketing Management

Master of Arts

The Master of Arts program in business administration is designed for the student who seeks an opportunity for specialization and/or a research experience.

It is assumed that the student has an undergraduate degree in business, or the equivalent. The student without this will be required to complete approximately 20 s.h. of additional coursework.

The program is available on both a thesis and nonthesis basis. Whereas the student aspiring to be a business or public administrator would normally seek the M.B.A. degree, the M.A. student might be contemplating a research or teaching career in a specialized area of business or employment in a business-related position requiring specialized knowledge. A student may take the master's degree as he or she proceeds toward a Ph.D. degree.

M.A. program is flexible to permit specialization according to the student's interests and objectives. The student may select a major in finance, insurance, marketing, administrative studies, management systems, industrial relations, or other areas. The minor may be developed from approved course combinations within the College of Business Administration or, under certain circumstances, elsewhere in the University.

Requirements for the Master of Arts degree with thesis include:

Major area	9 s.h.
Minor area	6 s.h.
Economic theory and/or administrative science	6 s.h.
Electives	6 s.h.
Thesis	3 s.h.
	30 s.h.

The Master of Arts degree without thesis requires:

Major area	12 s.h.
Minor area	6 s.h.
Economic theory and/or administrative science	6 s.h.
Electives	6 s.h.
Research methodology	3 s.h.
Research reports (two)	2 s.h.
	35 s.h.

The minimum number of semester hours for either program is normally earned in courses exclusively for graduate students (200 level), but where appropriate the student may take courses at the 100 level. Coursework beyond the minimum semester hour requirement may be required if the student's undergraduate preparation does not permit him or her to take graduate courses in a selected area.

A student in the thesis program will be expected to defend his or her thesis in an oral examination, and may be required to take a written and/or oral comprehensive examination over his or her coursework. A final oral examination is required in the nonthesis program.

Courses

Primarily for Upper-Division Undergraduates

6B:000 Cooperative Education Training Assignment **0 s.h.**

6B:15 Financial Management **3 s.h.**
Financial planning and management of money-capital in business firms; security markets. Prerequisites: 6A:2, 6E:2.

6B:20 General Insurance **3 s.h.**
Theory of risk and risk bearing; arrangements for dealing with risk; insurance industry, types of insurers, functions of insurers and government regulation of insurance; social insurance, basic features of selected insurance contracts. Prerequisite: 6E:2.

6B:31 Introduction to Marketing **3 s.h.**
General introduction to structure of marketing; marketing environment of an organization and its strategies with respect to marketing decisions; buyer behavior and management of marketing decisions.

6B:47 Introduction to Law **3 s.h.**
General history and structure of law; law's action in guiding changing economic and social patterns. Prerequisite: 6E:2 or junior standing.

6B:61 Administrative Management **3 s.h.**
Overview of problems encountered by members of task-oriented organizations; organizational administration; problem analysis and decision methods encountered in organizational environment.

6B:70 Quantitative Analysis **3 s.h.**
Quantitative models and application to decision making; calculus, linear programming, matrix algebra, game theory and other related operations-research techniques.

6B:71 Statistical Analysis **3 s.h.**
Fundamental principles of business evaluation; study of framework for solving managerial problems involving uncertainty or risk; discussion of collection and use of data.

6B:72 Computer Analysis **3 s.h.**
Functions of the computer; emphasis on its role in problem-solving; computer applications of quantitative models for decision-making using library routines and programs written by the student; programming included only to prepare student to use the computer.

6B:84 Production Management **3 s.h.**
Organization and management of manufacturing enterprises; production design and process planning, plant layout and materials handling, work simplification and measurement, production, inventory control, etc. Prerequisite: 6E:2.

Courses for Undergraduates and Graduates

6B:101 Directed Readings in Business Administration **arr.**
Individually-guided readings in selected topics in business.

6B:111 Investments **3 s.h.**
Activities involved in selecting among alternative financial assets from the viewpoint of the individual; present value; security markets; industry developments.

6B:112 Security Analysis **4 s.h.**
Valuation of corporate securities; financial statement analysis; economic and regulatory environment.

6B:113 Financial Markets and Institutions **3 s.h.**
The role of money and capital markets in the processes of change and development; flow of funds, institutions, instruments, pricing in financial markets.

6B:114 Commercial Banking **4 s.h.**
Management of commercial banks and other financial institutions. Emphasis on tools and concepts of running a bank, its assets and liabilities. May use case studies.

6B:116 Futures Trading **2-3 s.h.**
Historical development of futures trading, trading practices and procedures, hedging and regulatory aspects.

6B:118 Intermediate Financial Management **4 s.h.**
Case problem approach; methods of analyzing and planning current position of firms, management of all types of debt and equity capital structure planning; underwriting of security issues; cost of capital and capital budgeting. Prerequisite: 6B:15 or consent of instructor.

6B:119 Selected Topics in Finance **arr.**
In-depth study of selected topics in finance not covered by

regular courses; credit hours and course content determined by instructor. Prerequisite: consent of instructor.

6B:121 Property and Liability Insurance 3 s.h.
Business and individual needs for insurance, fire insurance, marine insurance and allied lines; public liability, automobile, other property and casualty coverages; insurance contracts and underwriting. Prerequisite: 6B:20.

6B:122 Life and Health Insurance 3 s.h.
Life, health and annuity contracts from the viewpoints of the individual, business, government and insurance companies; policy types, rate making, investments, regulation, group insurance, estate planning. Prerequisite: 6B:20.

6B:123 Public Economic Security Programs 3 s.h.
Government activities in creating economic security and alleviating poverty; causes of poverty and insecurity; current programs including OASDHI, unemployment compensation, AFDC, et al.; potential programs such as national health insurance, guaranteed annual incomes.

6B:124 Risk Management 3 s.h.
Nonspeculative risks in business and selected management devices for dealing with them; avoidance, assumption, reduction, and transfer of risk; risk management decisions; control of risk and reduction of losses; case studies in risk management. Prerequisites: 6B:121, 6B:122 or senior standing.

6B:125 Actuarial Principles of Life Insurance 3 s.h.
Same as 22S:125.

6B:126 Real Estate and Urban Land Economics 3 s.h.
Real estate and land utilization; nature of urban real estate and market forces affecting it; growth and structure of cities; zoning; procedures and techniques of property evaluation; elements of property management; real estate finance and brokerage. Prerequisite: 6E:2.

6B:129 Agents Property and Liability Insurance 1-2 s.h.

6B:132 Marketing Distribution Systems 3 s.h.
Design, analysis and control of complex marketing systems; emphasis on change and evolution, functional relationships, interorganizational behavior, and information channel management.

6B:134 Marketing Research 3 s.h.
Marketing and distribution research methods and role of marketing information as a management tool in decision making. Prerequisites: 6B:31 and introductory statistics, or consent of instructor.

6B:135 Consumer Behavior 3 s.h.
Emphasis on behavioral aspects of advertising and personal selling; discussion of influences on buying behavior, including learning, perception, dissonance, imagery, symbolism, personality, attitude, self, role, life-style, reference groups, culture, social class and family; strategic use of persuasive communications in marketing. Prerequisite: 6B:31 or consent of instructor.

6B:137 Advertising Theory and Planning 3 s.h.
Advertising as promotional force; emphasis on theory, planning and resulting strategic and tactical decisions that advertising executives make. Prerequisite: junior standing or above.

6B:138 Marketing Communications 3 s.h.
Nature of interpersonal and mass communication processes as derived from various theories and their roles in the marketing mix; emphasis on development of creative promotional strategy and tactics which coordinate advertising, personal selling, sales promotion, packaging, public relations and publicity into an effective, unified effort; readings, lectures, discussions, and exercises from behavioral sciences, general semantics, marketing.

6B:139 Sales Management 3 s.h.
The nature of personal selling and management of the sales force; includes recruiting, selection, and training of sales representatives; problems in the allocation of sales effort, supervision, and control. Extensive use of cases.

6B:141 Senior Seminar in Marketing 3 s.h.
Selected topics not covered in other courses; enrollment limited to superior students. Prerequisite: consent of instructor.

6B:147 Marketing Management 3 s.h.
Analysis of marketing problems of organizations; emphasis on the role of marketing manager in developing and presenting goal-oriented strategies; use of behavioral science concepts to understand buyers; study of marketing decision areas, including advertising, personal selling, product planning, pricing, distribution and competitive strategies; participation in computerized business games. Prerequisite: 6B:31.

6B:148 Law and Business 3 s.h.
Contract, agency and other operative areas of law applied in business; chiefly for accounting majors.

6B:149 Dynamics of Law 3 s.h.
Forces, historic and modern, that adapt law to changing industrial, economic and political society and that control the thrust of law; debate of landmark situations. Prerequisite: 6B:47 or senior standing.

6B:151 Employment Rights 3 s.h.
Individual and minority rights in industry, unions, urban centers and politics; emphasizes black history and problems.

6B:152 Labor Relations Legislation 3 s.h.
History of labor regulation and current federal public policy; examines unfair labor practices and representation issues, legal regulation of arbitration.

6B:153 Collective Bargaining 3 s.h.
Integration of historical, political, social, economic and legal threads underlying public policy governing collective bargaining and labor-management relations.

6B:154 Employee Relations in the Public Sector 3 s.h.
Public policy at federal, state and local levels in employee relations; legislative, legal, political and social considerations; occupational groups in education and hospitals as well as government.

6B:155 Manpower Policy and the Development of Human Resources 3 s.h.
Study and evaluation of national manpower policies in our economy. Emphasis on manpower planning at the federal, regional and local levels.

6B:158 Personnel Management 3 s.h.
Application of social science research and concepts to decisions and processes involved in managing personnel in organizations. Staffing, assessing, developing and rewarding personnel.

6B:159 Current Issues in Industrial Relations 3 s.h.
Specialized topics in industrial society; different topics offered each term, e.g., management development and training, research methods in industrial relations, quantitative methods in industrial relations. Prerequisite: consent of instructor.

6B:161 Individual Behavior in Organizations 3 s.h.
Principles of motivation, perception, learning, attitude formation, exchange, socialization, decision-making and task performance applied to behavior in organizational contexts. Prerequisites for B.B.A. students: 6B:61 and completion of the sociology or psychology requirement; for non-B.B.A. students: consent of instructor.

6B:162 Group Behavior in Organizations 3 s.h.
Basic characteristics of organizational structure and group processes from perspectives of a variety of social science concepts and theories; illustrative topics include authority and communication structures, intergroup relations, leadership and group task performance. Prerequisites for B.B.A. students: 6B:61 and completion of the sociology or psychology requirement; for non-B.B.A. students: consent of instructor.

6B:163 Design and Management of Organizations 3 s.h.
Applies organization theory to problems of organizational design and operations. Focus is on structure and processes appropriate for particular institutional settings. Case method. Prerequisite: 6B:161 or consent of instructor.

6B:168 Managerial Information Processing and Decision Behavior 3 s.h.
The design of organizational information and decision systems is considered in terms of behavioral science research on probability estimation, cue utilization, pattern recognition, etc. Prerequisite: 6B:161 or consent of instructor.

6B:169 Selected Problems in Administrative Management 3 s.h.
Specific problems in organizational behavior selected for intensive exploration; emphasis on applying social science to chosen problem; typical topics are bureaucracy, conflict, decision making, etc.; may be repeated. Prerequisite: 6B:161 or 6B:162 or consent of instructor.

6B:173 Managerial Economics 3 s.h.
Economic analysis applied to basic problems encountered in marketing, finance and production; provides foundation for more specialized work in these fields.

6B:175 Decision Theory for Business 3 s.h.
An introduction to decision theory applied to business problems; mathematical (no data) games; statistical (with data) games; utility functions; randomized decision functions; admissible procedures; Bayes's procedures; optional procedures; emphasis on business examples and case studies. Prerequisite: 6B:71.

6B:176 Operations Management 3 s.h.
Study of mathematical programming, including linear, nonlinear and dynamic programming, with applications in economics and management; classical optimization techniques, measurement theory, and transportation and network flow problems. Prerequisite: 6B:70 or consent of instructor.

6B:177 Simulation Methods 3 s.h.
Methods and techniques of computer simulation and its relationship to business decision making; definition and procedures for simulation; random variable generation; statistical validation of simulations; analysis of simulation outputs for decision making. Prerequisite: 6B:72.

6B:178 Topics in Operations Management 3 s.h.
Selected topics in operations management; in-depth study of areas such as mathematical programming, simulation, inventory, forecasting and game theory. Prerequisite: consent of instructor.

6B:180 Management Information Systems 3 s.h.
Nature of systems; parameters for the business system; measurement problems; information theory and its relationship to measurement and control; system design, analysis, models for management, decision making and control of systems. Prerequisite: 6B:61.

6B:181 Topics in Management Information Systems 3 s.h.
Study of the design and implementation of an information system; students assigned project in which they determine information needs, design the system, develop implementation plans, etc.

6B:182 International Business 3 s.h.
Study of multinational business, international monetary system, bases for world trade, development of less-developed countries, foreign investment; distinctions between international and domestic business operations emphasized.

6B:183 Topics in International Business 3 s.h.
Intended for students having special interests in international aspects of business, this course covers a few topics in depth, e.g., multinational industry studies, financing international companies, etc.

6B:184 Production Planning and Control 3 s.h.
Methods of setting the limits, regulation and levels of production in the individual firm. Prerequisite: 6B:84.

6B:188 Entrepreneurship and New Business Formation 3 s.h.
Characteristics of the successful entrepreneur and of making the decision to go into business for one's self. Development of a procedural system for establishing a new business; case studies. Prerequisite: senior standing.

6B:189 Managing the New or Small Business 3 s.h.
Role of small business in the economy. Management of the ongoing small business, and problems confronting the entrepreneur in the small enterprise. Prerequisite: senior standing.

6B:190 Experimental Course arr.
Available for special courses not regularly offered.

M.B.A. Foundation Courses

(Open to graduate students and selected seniors in the "3-2" program)

6B:193 Computer Methods—M.B.A. 2 s.h.
Use of computers in business management; computer programming languages emphasizing time-shared BASIC, library programs, systems design, MIS, data base structure.

6B:194 Managerial Finance—M.B.A. 2 s.h.
Goals of financial management, characteristics of financial instruments and markets, cost of funds and allocation of resources, working capital management. Prerequisite: 6A:192.

6B:195 Management of Organizations—M.B.A. 3 s.h.
Fundamental concepts, research and applications used in accomplishing organizational tasks through collective efforts; decision making, organizational design and change, staffing techniques, control mechanisms, etc.

6B:196 Marketing Management—M.B.A. 2 s.h.
Marketing's relationship to business and society, environmental influences on marketing, strategic and tactical decisions faced by the marketing manager.

6B:197 Quantitative Methods—M.B.A. 3 s.h.
Quantitative methods applicable to business and economic problems; calculus, linear algebra, examples in production, marketing, finance and management.

6B:198 Society, Law, and Business—M.B.A. 2 s.h.
The real vs. the ideal, perception and uses of value, the ideas that underlie our institutions, the intellectual tasks of participating in an industrial society.

Primarily for Graduates

6B:201 Directed Readings in Business Administration arr.
Individually-guided readings in selected topics in business administration.

6B:202 M.A. Research Report 1 s.h.
This course is for nonthesis M.A. candidates only. The one-hour credit is for a major paper. Prerequisite: consent of instructor.

6B:206 Social Environment of Industry—M.B.A. 3 s.h.
Focus on social problems facing the country—race, ecology, urbanization, etc.; primary emphasis on industry's role with respect to both causes and solutions; various roles of government and citizens' groups.

6B:212 Investment Management 3 s.h.
Examination of various types of securities available for investment; analysis of financial statements and evaluation of securities; methods of managing an investment portfolio using cases. Prerequisite: 6B:194.

6B:215 Financial Policy Decisions—M.B.A. 3 s.h.
Problems approach to policy, structured problems and cases; decision models; current and fixed asset administration, raising funds, cost of funds, capital budgeting, dividends, mergers. Prerequisite: 6B:194 or equivalent.

6B:216 Financial Markets 3 s.h.
Organization, role and regulation of capital markets; influence of governmental financing; interaction of financial markets with other economic developments. Prerequisite: consent of instructor.

6B:217 Portfolio Theory and Planning 3 s.h.
Examination of modern theoretical concepts relating to management of portfolios of financial institutions; topics include portfolio models, performance measurement, risk and portfolio construction. Prerequisite: consent of instructor.

6B:218 Seminar in Finance arr.
Prerequisite: consent of instructor.

6B:219 Capital Budgeting 3 s.h.
Alternative approaches to cost of money-capital and to performance measurements for investment projects; explicit consideration of certainty, risk and uncertainty in selection of investment projects; theory and applications in private and public sectors.

6B:220 Management of Financial Institutions 3 s.h.
Predominantly case-study approach to analysis of problems and operations of various major U.S. financial institutions including commercial banks, insurance companies, savings and loan associations, mutual savings banks and credit unions; industry and regulatory considerations. Prerequisite: 6B:194 or consent of instructor.

6B:222 Insurance and Employee Benefits 3 s.h.
Practical application of insurance products to group security problems with concentration on group insurance and pension plans.

6B:223 Risk, Uncertainty, and Insurance 3 s.h.
Selected theoretical aspects of risk and insurance; economic and mathematical aspects; current problems in insurance.

6B:224 Risk Management in Business 3 s.h.
Nonspeculative risks in business and selected management devices for dealing with them; assumption, avoidance, transfer and reduction of risk; risk management decisions; control of risk and reduction of losses; case studies in risk management.

6B:225 Seminar in Insurance arr.
Prerequisite: consent of instructor.

6B:232 Marketing Management II—M.B.A. 3 s.h.
Internal and external environment of marketing decisions; behavioral science applied to consumer behavior, information sources, marketing goals, plans and strategies. Prerequisites: 6B:196, 6B:271.

6B:233 Marketing Research Methods 3 s.h.
Methods of design and analysis of marketing research studies, including surveys and laboratory and marketplace experiments, consideration of information valuation, sampling, sources of bias, instrument construction and statistical analysis.

6B:235 Buyer Behavior 3 s.h.
Study of behavior of consumers and industrial buyers; examination of research methods and findings from behavioral sciences. Prerequisite: consent of instructor.

6B:239 Multivariate Methods in Marketing 3 s.h.
Brief overview of multivariate methods and concentration on these methods as they relate to marketing problems: regression analysis, factor analysis, discriminant analysis, canonical analysis, AID analysis and clustering; illustrations from marketing literature.

6B:240 Marketing Models 3 s.h.
Examination of theoretical and operational models in marketing with emphasis on recent advances; logical flow and quantitative models which attempt to solve marketing management problems; in-depth criticism of a number of models and participation in model-development project.

6B:241 Psychological Scaling for Marketing Applications 3 s.h.
Surveys a number of psychological scaling techniques which have applications in consumer research in marketing; topics include definition and properties of scale types, unidimensional and multidimensional scaling models, nominal scales and cluster analysis; some emphasis on data collection methods and computer algorithms.

6B:242 Seminar in Marketing arr.
Examination of current marketing literature and current research interests of faculty and students. Prerequisite: consent of instructor.

6B:251 Concepts of Fair Employment 3 s.h.
Case studies, augmented by library research in race, sex, age and health discrimination. Other groups facing public and private discrimination will also be considered.

6B:252 Employment Relations and Public Policy 3 s.h.
Public policy issues related to collective bargaining and labor-management relations.

6B:255 Compensation Administration 3 s.h.
Theories, principles, methods, and problems of administration of pay, methods of job evaluation; psychological and economic principles of compensation; wage levels and structures; rate ranges and incentive plans; wage and benefit surveys; job analysis; and selected compensation problems. Prerequisite: 6B:158 or a personnel course.

6B:256 Industrial Relations—M.B.A. 3 s.h.
Industrial relations issues confronting management; functioning of labor markets, macro manpower problems, micro management of human resources, labor- management relations. Prerequisite: 6E:100.

6B:257 Training and Development 3 s.h.
Theories, principles, and practices of personnel training and development, selected principles of human learning, motivation and perception; the role of training and development in organizations; assessment of training needs; assessment of various training methods; and methods of training evaluation.

6B:258 Human Resources Management 3 s.h.
Principles for managing personnel derived from social sciences are applied to problems of recruitment, selection, training, performance evaluation, compensation, health and safety, and discrimination. Prerequisite: consent of instructor.

6B:259 Seminar in Industrial Relations arr.
Selected problems in human resources management. Prerequisite: consent of instructor.

6B:261 Administrative Science I—M.B.A. 3 s.h.
Goals, concepts and research findings in motivation, learning, perception, attitudes and attitude change, social

exchange, influence, thinking and problem solving are considered in depth. Prerequisites: 6B:195 or equivalent.

6B:262 Administrative Science II: Group Processes in Administration 3 s.h.
Understanding, predicting and controlling small group processes to achieve organizational goals; formation of work groups, impact on group outputs of their environment, composition, cohesiveness and structure. Prerequisite: 6B:261 or consent of instructor.

6B:263 Administrative Science III: Organizational Design and Operation 3 s.h.
Organization theories applied to effective administrative design; emphasis on how task-oriented organizations relate to other social institutions, function and change; issues approached from macro viewpoint.

6B:265 Administrative Policy—M.B.A. 3 s.h.
Nature, scope and complexity of chief executive's job; functional integration of all managerial activities; must be taken in last semester of M.B.A. program. Prerequisite: 6B:194, 6B:261. Corequisite: 6B:276.

6B:266 Behavioral Science and Business Organizations I 3 s.h.
Integrated, two-semester examination of concepts, findings and methods of behavioral sciences applicable to many aspects of business; includes organizational theory, small-group behavior and individual behavior. Students without any intermediate-level courses in either psychology or sociology should anticipate heavy course load. Designed to meet basic area requirement for Ph.D. in business administration, but other graduate students admitted with consent of instructor. Prerequisite: 6B:261 or equivalent.

6B:267 Behavioral Science and Business Organizations II 3 s.h.
Continuation of 6B:266, which is prerequisite.

6B:268 Organizational Decision Behavior 3 s.h.
Application of behavioral decision theory to problems of managerial inference, information systems design, decision definition, and the evaluation of decision-making processes. Prerequisite: consent of instructor.

6B:269 Seminar in Behavioral Science Problems in Organizations 3 s.h.
Theoretical and methodological topics in behavioral science treated in depth, e.g., applied measurement techniques, behavioral economics, human information processing, theories of motivation, principles of rationality, etc. Prerequisites: 6B:161-162 or 6B:261-262 or 6B:266-267 or consent of instructor.

6B:270 Research in Business Administration arr.
Individually guided research projects on appropriate topics in business administration. Prerequisite: consent of instructor.

6B:271 Statistical Methods—M.B.A. 3 s.h.
Contrast between classical and Bayesian approaches to decisions under uncertainty; applications of probability models, estimation, hypothesis testing and regression analysis to business problems. Prerequisite: 6B:197 or consent of instructor.

6B:273 Managerial Economic Theory—M.B.A. 3 s.h.
More advanced applications of economic analysis to business problems; topics covered include estimation of demand, analysis of production, pricing in oligopolistic industries, investment analysis in situations characterized by risk. Prerequisites: 6B:271, 6E:100; 6E:190 desirable.

6B:276 Operations Research in Business—M.B.A. 3 s.h.
Linear programming, dynamic programming, game theory, queueing, and other optimization models applied to business decisions. Prerequisite: 6B:271.

6B:277 Advanced Operations Research 3 s.h.
Applications of mathematical models for decision problems; nonlinear, quadratic, integer and dynamic programming; selected stochastic and game theoretic systems. Prerequisite: 6B:276 or 6B:286.

6B:278 Forecasting 3 s.h.
Forecasting used in business; naive models such as moving average and exponential smoothing; structured models such as regression and Box-Jenkins time series models. Prerequisite: 6B:271 or 6B:286.

6B:280 Management Systems—M.B.A. 3 s.h.
Contributions to management information systems from the areas of management, general systems theory, economics, information theory, organizational behavior and mathematical models. Prerequisites: 6B:193, 6B:271.

6B:281 Systems Management 3 s.h.
Study of business organization from systems viewpoint; topics include general systems theory, cybernetics, information theory and decision theory; organization-environment phenomenon and the manner in which organizations acquire information about their environment are examined.

6B:282 International Business 3 s.h.
Special problems related to operation of business in foreign environment, discussed mostly in international economics framework. Prerequisite: consent of instructor.

6B:283 Seminar in International Business 3 s.h.
Selected topics in international business with emphasis on dual decision-making authority (government and business) within which business operates, and on research frontiers of field. Prerequisite: consent of instructor.

6B:284 Production Management 3 s.h.
Analytical and interrelated approach to planning, operation and control of production process; heuristics, linear programming and mathematical models used as analytical tools. Prerequisite: consent of instructor.

6B:285 Seminar in Production Management arr.
Prerequisite: consent of instructor.

6B:286 Statistics for Decision-Making I —Ph.D. 3 s.h.
Probability, random variables, mathematical expectation, generating functions and probability distributions; statistical estimation and hypothesis testing; Bayes's theorem, prior and posterior probabilities; decision making under uncertainty; for Ph.D. basic area requirement. Prerequisite: 6B:271.

6B:287 Statistics for Decision-Making II —Ph.D. 3 s.h.
Correlation, regression and general linear hypothesis; experimental design and analysis of variance; sampling theory and nonparametric statistics; for Ph.D. basic area requirement. Prerequisite: 6B:286.

6B:288 Management Science for Decison-Making—Ph.D. 3 s.h.
Classical optimization (LaGrange, Kuhn-Tucker, linear programming), model building, measurement theory and information theory; for Ph.D. basic area requirement. Prerequisite: 6B:197 or consent of instructor.

6B:289 Seminar in Management Science 3 s.h.
Special topics in quantitative methods of current interest to faculty and students, e.g., decision theory, simulation, inventory theory, mathematical programming, theory of measurement, foundations of statistics. Prerequisite: consent of instructor.

6B:290 Thesis in Business arr.
Prerequisite: consent of instructor.

6B:291 Seminar in Management arr.
Prerequisite: consent of instructor.

6B:292 Seminar in Comparative Regulatory Techniques 2 s.h.
Comparison of techniques used by modern industrial nations to direct and stimulate economy in a desired direction; focus on France. Prerequisite: consent of instructor.

6B:299 Field Studies in Business Administration 3 s.h.
Substantive knowledge regarding various aspects of business organization, operations, and development applied to real problems in on-going business firms; individual and/or teams of students prepare field studies under faculty supervision.

Business Education

Chair: Norman F. Kallaus
Faculty: *professor* Norman F. Kallaus
assistant professors Edith Ennis, Shirley Kuiper, Ernest V. Zuber
research scientist Donald G. Davison
Degrees offered: B.B.A., M.A., M.A.T., Ph.D.

The Undergraduate Program

The undergraduate program in Business Education is designed primarily for people who want to become teachers of business subjects at the secondary school level. Students in the program have two options: completing a major by satisfying one of several possible options in the College of Business Administration, or electing at least two nine-hour sequences from the available options. In addition, students majoring in business education must complete the general requirements for the Bachelor of Business Administration degree, as well as the courses required for the Iowa Professional Teaching Certificate.

Business education majors receive a broad foundation in business administration and economics, as well as specialized professional courses in business education, to prepare them for their first teaching experience. Graduates of the program are qualified for positions in business as well as teaching.

Typically, business education students prepare for teaching two types of business subjects at the secondary school level. One type of program prepares teachers of basic business subjects (e.g., general business, business law, economics, consumer economics, business management, business mathematics and accounting).

Another type of program is available for the preparation of teachers of office-related subjects (typewriting, shorthand, word processing and office practice), in addition to those listed for the basic business teacher.

Student teaching under the supervision of both an experienced secondary school business teacher and a university professor

is the capstone of the undergraduate program.

The student must choose from one of these options:

Business Major Option

Complete the requirements for a major in one of these areas in the College of Business Administration:

Accounting
Administrative Management
Economics
Finance
Financial Economics
Industrial Relations
Insurance
Industrial Relations
Management Systems/Management Science
Marketing
Administrative Services (see below)

Areas of Concentration Option

Complete two nine-hour sequences from the following areas in the College of Business Administration:

Accounting
Administrative Management
Economics
Finance
Financial Economics
Industrial Relations
Insurance
Management Systems/Management Science
Marketing
Administrative Services (see below)
Basic Business (see below)

Requirements for the Administrative Services Major

6S:2 Business Typewriting Problems	3 s.h.
6S:22 Advanced Shorthand and Transcription	3 s.h.
6S:35 Business Machines Applications	2 s.h.
6S:112 Word Processing	3 s.h.

One of the following:

6S:125 Organizational Communication	3 s.h.
6S:126 Written Communication in Business	3 s.h.
One of the following:	
6S:145 Office Management	3 s.h.
6S:155 Data Processing with COBOL	3 s.h.
	17 s.h.

Administrative services majors who do not intend to teach shorthand must substitute 6S:147 Basic Systems Analysis.

Requirements for Concentration in Basic Business

6S:103 Decision Making for Consumers	3 s.h.
6S:104 Principles of Basic Business	3 s.h.
One additional course in business administration or economics, approved by adviser	3 s.h.
	9 s.h.

Teacher Certification

The courses required for the Iowa Professional Teaching Certificate can be found in the College of Education section of this *Catalog*. In addition, these courses are required of all business education teaching majors:

6S:191 Principles of Business Education (to be taken in junior year)	3 s.h.
6S:192 Methods: Business Subjects	3-6 s.h.
7S:187 Seminar: Curriculum and Student Teaching (taken concurrently with student teaching)	1-3 s.h.

Courses for Nonmajors

Two areas of concentration in administrative services without the teacher certification courses, consisting of a minimum of three courses (9 s.h.) in each area or a total of 18 s.h., can be arranged for students pursuing a nonteaching degree in business administration.

The Graduate Programs

Certification Only

This is a special classification for graduate students who have earned bachelor's degrees without fulfilling requirements for a secondary teaching certificate. For this type of program, the student fulfills all certification requirements by completing a sequence of graduate-level education courses (20-28 s.h.) approved by the adviser (see M.A.T. Program below). In addition, the student may be required to complete courses in business administration, accounting, and economics to strengthen undergraduate preparation in business. The business education course 6S:191 Principles of Business Education is also required. No degree objective is implied, although it is possible to request a change in graduate status. In such instances, the normal faculty review of the student's qualifications would occur before any change could be made.

Professional Improvement (P.I.)

This is a special-status category for graduate students who wish to complete additional coursework without a further degree objective. Students so classified must be formally accepted as P.I. students and must meet regularly with an adviser. At the same time, there is great latitude in the types of courses which are possible. Many students interested in special workshops, seminars, conferences, and institutes are admitted in this category. If such students wish to apply for a degree at a later time, all credit completed while admitted for P.I. must be evaluated, and the application is reviewed as if it were a new one for admission purposes.

M.A. Program

This nonthesis program in business education is designed for the graduate student who holds a teacher's certificate and has either a major or a minor teaching area in business education. Its purpose is to upgrade professional competence in teaching business subjects in the secondary school or at the community college level.

Upon completion of the courses required for the three areas of study in business education, business administration, and education, the candidate selects for the final comprehensive examinations either a two-hour examination in each area, or a three-hour examination in business education and a three-hour examination in one of the remaining two areas.

A minimum of 32 s.h. must be included in the program with the adviser's approval, within these flexible distributions:

Business Education

6S:201 Foundations of Business Education	3 s.h.
6S:265 Directed Readings	1 s.h.
Three of the following:	
6S:203 Seminar: Basic Business	2-3 s.h.
6S:204 Seminar: Teaching Accounting	2-3 s.h.
6S:205 Seminar: Office Education	1-3 s.h.
6S:207 Seminar: Information Processing	3 s.h.
6S:210 Managing Business Instruction	3 s.h.
6S:240 Seminar: Business Teaching	2-3 s.h.
Total	12-17 s.h.

Business

Six to 15 s.h. of credit in business administration, accounting, economics, or related business areas, such as business data processing, business communication, office management, or business systems.

Education

Six to 12 s.h. of credit in general education areas which meet the professional needs of the student, such as counselor education; educational administration; educational psychology, measurement, and statistics; instructional design and technology; postsecondary and continuing education; or special education.

Admission Requirements

The student must meet the requirements for admission to the University of Iowa Graduate College. For regular admission, the student must have a G.P.A. of 2.50 and a Graduate Record Examination total score of 1000. If the student's total Graduate Record Examination is less than 1000 and no offsetting evidence of superior ability is available, admission may be conditional. Teaching experience is desirable but not required, and the candidate must hold a valid teacher's certificate.

M.A.T. Program

The Master of Arts in Teaching (M.A.T.) program is a 38-semester-hour nonthesis course of study. It is designed for superior business graduates who have had few or no education courses. The program enables students to enrich their background by completing graduate courses in substantive business and business education areas and in graduate courses which constitute professional preparation for secondary school teacher certification or community college teaching.

Two summers and two semesters are usually necessary to complete the M.A.T. program, which requires 18 semester hours in business and business education and 20 semester hours in graduate education courses.

The business and business education courses must include:

6S:191 Principles of Business Education	3 s.h.
6S:192 Methods: Business Subjects	3-6 s.h.

The graduate courses in education must include:

Educational psychology	3 s.h.
Philosophy or history of education	3 s.h.
Observation and laboratory practice (student teaching)	12 s.h.
One approved elective	2-3 s.h.

Candidates for the M.A.T. degree must pass comprehensive final examinations in business education and in education. These examinations are taken during the session in which the candidate expects to receive the degree.

Admission Requirements

To be admitted to the M.A.T. program, the candidate must have a bachelor's degree in business administration and meet the general requirements for admission to the University of Iowa Graduate College. For regular admission, the student must have a G.P.A. of 2.70 and a Graduate Record Examination total score of 1000. If the candidate's total Graduate Record Examination score is less than 1000 and no offsetting evidence of superior ability is available, the admission may be conditional.

Ph.D. Program

The program is available to qualified candidates who aspire to college and university positions as business teacher educators or to administrative positions in business education. Graduates of this program have also assumed administrative positions in other areas of education and in business, industry, and government.

The Ph.D. program is designed to improve the competence of business teachers at the postsecondary school level, primarily four-year college-level teachers of business teacher education programs and to strengthen the research and administrative skills of students aspiring to both instructional and administrative positions in postsecondary and secondary business education programs.

The Ph.D. candidate in business education is expected to satisfy the requirements for two tools of research before taking the comprehensive examinations. The tool areas are to be chosen from foreign language, statistics, advanced mathematics, computer programming, scientific methods, or other appropriate research tools approved by the adviser.

The doctoral program requires coursework, approved by the adviser, in each of the following areas:

Business Education

Common core recommended:

6S:201 Foundations of Business Education	3 s.h.
6S:210 Managing Business Instruction	3 s.h.
6S:270 Seminar: Business Education Research	3 s.h.
6S:280 Seminar: Business Education Policy	3 s.h.
Two additional 200-level courses in business education	6 s.h.
Total	18 s.h.

Cognate and Related Areas

Business: A minimum of 9 s.h. in 200-level courses in accounting, business administration, economics, or administrative-support systems (including business communications, data processing and systems, and related courses).

Education: A minimum of 9 s.h. in 200-level courses from such areas as counselor education; educational administration; educational psychology, measurement, and statistics; instructional design and technology; postsecondary and continuing education; or special education.

The program requires the completion of 90 semester hours beyond the bachelor's degree, including the dissertation and two approved courses in economic theory beyond principles of economics. A three-hour comprehensive examination is required in each area of study.

Financial Aids

A number of graduate assistantships are available for M.A., M.A.T., and Ph.D. candidates. These include teaching assistantships, research assistantships, and assistantships for supervising machine laboratories. To be eligible for such assistantships, the student must have been accepted for graduate work at The University of Iowa and possess the qualifications, preferably involving successful teaching experience, for the type of position available.

Admission Requirements

The student must meet the requirements for admission to the University of Iowa Graduate College. For regular admission, the student must have a G.P.A. of 2.70 and a Graduate Record Examination total score of 1000. If the candidate's total Graduate Record Examination score is less than 1000 and no offsetting evidence of superior ability is available, the admission may be conditional. Teaching experience is desirable, with a previous teaching major in business education or a cognate area preferred.

Courses

Primarily for Undergraduates

6S:1 Basic Typewriting 2 s.h.
Keyboard mastery; problem solving related to personal and business communications such as letters, memoranda, and reports. Open only to students with no previous formal typewriting course.

6S:2 Business Typewriting Problems 3 s.h.
Emphasis on in-depth development and integration of skills and knowledge necessary for solving problems related to the production of letters, forms, manuscripts, reports, and other business communications. Prerequisite: 6S:1 or equivalent.

6S:21 Basic Shorthand 3 s.h.
Shorthand theory and development of skill through business dictation and transcription. Open to students with less than one year of high school shorthand or equivalent. Prerequisites: 6S:1 and consent of instructor.

6S:22 Advanced Shorthand and Transcription 3 s.h.
Review of shorthand theory; emphasis on development of advanced skill in taking business dictation and in transcribing on a production basis. Prerequisite: 6S:21 or equivalent; corequisite: 6S:2 or equivalent.

6S:35 Business Machines Applications 2 s.h.
Business-related mathematical processes and basic statistical measures; emphasis on business applications using modern calculating machines.

For Undergraduates and Graduates

6S:101 Independent Study arr.
Individually guided readings and projects in business education. Prerequisites: junior standing and consent of instructor.

6S:103 Decision Making for Consumers 3 s.h.
Application of problem solving in such cases as consumer credit and financial decisions. Emphasis on citizens' consumer action and basic economic principles. Same as 7S:103.

6S:104 Principles of Basic Business 3 s.h.
Integration of principles of business structure, economics, and personal finance; intended primarily for secondary school teachers of business and social studies subjects. Same as 7S:104.

6S:112 Word Processing 3 s.h.
Concepts of word processing, a systems approach for improving efficiency of business communication; emphasis on word processing management; includes orientation to automatic typewriting/editing systems and dictating/transcribing equipment. Prerequisite: 6S:2 or equivalent.

6S:125 Organizational Communication 3 s.h.
Organizational, interpersonal, and language processes in business and other institutional settings; nonverbal behavior; communication systems and technologies. Prerequisites: satisfaction of rhetoric requirement or equivalent, and junior standing.

6S:126 Written Communication in Business 3 s.h.
Application of communication theory and semantic principles to written communication; emphasis on relationship of communication principles to the inquiry and reporting process in business; correspondence and memo writing integrated with research and report processes. Prerequisites: satisfaction of rhetoric requirement or equivalent and junior standing.

6S:145 Office Management 3 s.h.
Principles of organization and management related to the information production function in organizations; selection, development and evaluation of personnel and procedures in office systems. Prerequisite: junior standing.

6S:147 Basic Systems Analysis 3 s.h.
Introduction to systems philosophy, theory and practices; systems analysis, design and measurement; applied systems projects. Prerequisite: junior standing..

6S:155 Data Processing with COBOL 3 s.h.
Information needs and business systems for processing data; introduction to COBOL programming of common business systems problems; managerial considerations in data processing. Prerequisite: junior standing.

6S:191 Principles of Business Education 3 s.h.
Philosophy, objectives and planning strategies for the business education curriculum; relationships of business programs to various educational levels. Offered spring semester only.

6S:192 Methods: Business Subjects 3-6 s.h.
Study of objectives, content, materials and methods for teaching business subjects; students may enroll for three to six semester hours of credit, depending on areas of certification chosen, from the following modules: typewriting, shorthand, office education, bookkeeping/accounting, basic business. Offered fall semester only. Prerequisites: 6S:191 and consent of instructor. Same as 7S:110.

6S:193 Current Consumer Topics 1-3 s.h.
Current issues, developments and laws; applications to individuals and families. May be repeated for credit. Same as 17:125.

6S:195 Organization and Administration of Cooperative Programs 3 s.h.
Objectives, operation and coordination of cooperative office, distributive education, and other cooperative programs. Same as 17:127.

6S:197 Philosophy of Vocational Education 2 s.h.
Study of the philosophy of vocational education programs on local, state, and national levels; past development and present status of vocational, technical, and adult education in the nation, with special emphasis on Iowa programs. Same as 7H:197.

6S:198 Special Problems arr.
Individualized special problem areas for study on either an independent study or group study basis. Prerequisites: junior standing and consent of instructor.

6S:199 Business Education Workshop arr.
Intensive programs on instructional methods, evaluation, trends and innovations in business education. Offered summers only.

Primarily for Graduates

6S:201 Foundations of Business Education 3 s.h.
Underlying philosophies, ideas, concepts and principles which have guided business education programs at the secondary, postsecondary, and collegiate levels; analysis of thought and practices pertaining to education generally and to business education, career education and vocational education, specifically. Same as 7S:201.

6S:203 Seminar: Basic Business 2-3 s.h.
Applications of curriculum development principles to the teaching of basic business subjects. Emphasis on economic principles and consumer learnings which underlie all basic business subjects. Same as 7S:203.

6S:204 Seminar: Teaching Accounting 2-3 s.h.
Accounting principles and cyclical analysis; application of teaching techniques. Primarily for high school and community college teachers of bookkeeping, accounting and data processing subjects. Same as 7S:204.

6S:205 Seminar: Office Education 1-3 s.h.
Trends and research in office education at high school and community college levels; analysis of methods of individualized instruction, correlation of classroom instruction with work experience, and evaluation techniques in office education. Required for coordinators of cooperative office education programs. Same as 7S:205.

6S:207 Seminar: Information Processing 3 s.h.
Information-processing concepts (from manual to automated) for business teachers and administrators; analysis and development of instructional systems, materials, and methods of teaching and evaluation.

6S:210 Managing Business Instruction 3 s.h.
Development of effective business-teaching at all educational levels. Principles of effective instructional design, methodology and supervision. Same as 7S:210.

6S:225 Seminar: Business Communication 3 s.h.
Organizational, systems, and communication theories in business; communication research and methodology; communication programs for business, governmental, and educational institutions. Prerequisite: consent of instructor.

6S:240 Seminar: Business Teaching 2-3 s.h.
Intensive study of selected issues in business education. May be repeated once for credit. Same as 7S:211.

6S:245 Seminar: Management Support Systems 3 s.h.
Administrative services functions; design, analysis, and evaluation of support systems. Prerequisite: consent of instructor.

6S:265 Directed Readings arr.
Individual readings in business education, data processing, communication or office management. Prerequisites: graduate standing and consent of instructor. May be repeated to maximum of six semester hours.

6S:270 Seminar: Business Education Research 3 s.h.
Analysis of research process and product in business education; examination of key research in business education; assessment of research needs; identification of researchable problems suitable for doctoral study.

6S:275 Research: Business Education arr.

6S:280 Seminar: Business Education Policy 3 s.h.
Application of management principles, policy formation and leadership to the role of the department head in business education. Limited to doctoral students in business education.

6S:290 Thesis: Business Education arr.

Economics

Department chair: Calvin D. Siebert
Faculty: *professors* Jerald Barnard, Anthony Costantino, Warren Dent, James Jeffers, Walter Krause (Murray Professor), Chester Morgan, Gerald Nordquist, Thomas Pogue, Calvin Siebert, S.Y. Wu, J. Richard Zecher *professors emeriti* Paul Olson, George Peck *associate professors* William Albrecht, Michael Balch, Hyman Joseph, Larry Sgontz, Samuel Williamson *assistant professors* Susan Alexander, J. Frank O'Connor, Andrew Policano, Raymond Riezman
Degrees offered: B.A., B.S., B.B.A., M.A., Ph.D.

Economics is concerned with the organization of production and consumption in society, and the associated welfare of the people. It involves the systematic study of such topics as wealth and poverty, money and banks, income and consumption, government expenditures and taxation, prosperity and depression, inflation and unemployment, big business and labor unions, and hundreds of other matters that intimately affect the way people live.

Economics seeks to develop an understanding of how complex economic systems work, along with training in the methods of economic analysis which can be applied to a wide range of economic problems. Study of economics is desirable simply from the standpoint of being an informed citizen capable of exercising rational choice at the voting booth. Accordingly, the Department offers a wide range of coursework to meet the needs of the nonmajor in economics as well as the economics major.

Undergraduate Majors

The bachelor's degree programs in economics provide an excellent educational background for a variety of positions in business and government. Graduates find employment in banking, financial institutions, industrial firms, and trade organizations, and in federal, state and local government agencies dealing with economic policy, regulation and analysis. Economics is also regarded as excellent preparation for law and for graduate study in such fields as business management, public administration, health and hospital administration, urban and regional planning, transportation, journalism, political science, and statistics.

The Department offers three undergraduate degrees in economics—the B.A. and B.S. degrees in the College of Liberal Arts and the B.B.A. in the College of Business Administration. The B.A. degree in economics is designed to allow the student maximum flexibility in attaining a well-rounded liberal arts education. The College of Business Administration requirements associated with the B.B.A. degree in economics emphasize a background in the business fields of accounting, finance, marketing, business law, and management.

For a description of the B.A. and B.S. degree programs in economics, see the College of Liberal Arts section of the *Catalog*.

Program for the B.B.A. Degree

In addition to the common requirements for students in the College of Business Administration, the B.B.A. degree in economics requires 18 semester hours in 100-level economics courses, including 6E:103 Microeconomics and 6E:105 Macroeconomics.

Candidates for the B.B.A. degree may meet the requirements for the degree through an alternative program by meeting the common requirements in the College of Business Administration and completing two areas of concentration, each consisting of at least three courses (nine semester hours), two of which must be courses offered by the College of Business Administration. A student may select courses from those offered by the Department of Economics to fulfill the areas of concentration requirement. The two areas of concentration must be approved by the student's adviser.

Graduate Program

Master of Arts

The M.A. degree provides training in applied economics. It can be completed in three semesters. A student who performs well in the first semester can transfer to the Ph.D. program at that time with no loss of credit.

Specialized M.A. programs from which the student may choose include: environmental economics; urban and regional economics; international economics and finance; economic development; financial and monetary economics; economics of the public sector; health economics; economic planning and budgeting; business and managerial economics; and labor economics and labor relations. A complete description of these programs is available from the Department.

The Department offers a joint M.A.-J.D. program in which it accepts up to nine semester hours in law to apply to the M.A. degree, and the College of Law accepts coursework in economics to apply toward the law degree.

M.A. Course Sequence

First Semester

6E:183 Statistical Methods in Econometrics	3 s.h.
6E:200 Topics in Economics	1 s.h.
6E:204 Macroeconomics I	3 s.h.
History course or elective	3 s.h.

Second Semester

6E:202 Price Theory	3 s.h.
6E:184 Methods of Quantitative Economics	3 s.h.
Electives	6 s.h.

Third Semester (nonthesis option)

All M.A. students are required to take one course in either economic history or history of economic thought. In addition, the student will take three electives and write a thesis for a minimum of 32 semester hours, or take five electives and write two research papers in two 200-level economic courses for a minimum of 34 semester hours.

The program is designed so that it can be completed in three semesters. However, those who find the workload too heavy may wish to take six semester hours during the summer between second and third semesters, or take a fourth semester.

Doctor of Philosophy

The Ph.D. program is designed to provide students with rigorous training in the areas of microeconomic theory, macroeconomic theory, mathematical economics, and econometrics. In addition, the student selects a major area for intensive study and specialization. The usual time required to complete the Ph.D. program is four years. The Ph.D. program has three components: a coordinated sequence of core courses, a set of major area courses, and a dissertation.

Core Component

The core component is designed to bring students to a high level of technical competence. The academic load in the core sequence assumes that the student is employed as a research or teaching assistant. Students not employed may carry additional courses.

The Ph.D. program has a minimum mathematics requirement of two semesters of calculus. This requirement must be satisfied by the end of the first semester of the program.

The core sequence:

First Semester

6E:180 Mathematics for Economists	3 s.h.
6E:183 Statistical Methods in Econometrics	3 s.h.
6E:200 Topics in Economics	1 s.h.
6E:204 Macroeconomics I	3 s.h.

Second Semester

6E:203 Microeconomics I	3 s.h.
6E:206 Macroeconomics II	3 s.h.
6E:211 Mathematical Economics I	3 s.h.

Third Semester

6E:205 Microeconomics II	3 s.h.
6E:221 Econometrics I	3 s.h.
Field course	3 s.h.

Fourth Semester

6E:222 Econometrics II	3 s.h.
Field courses	6 s.h.

For students with sufficient mathematical and statistical background, 6E:180 and/or 6E:183 are waived.

Students planning to specialize in econometrics should take appropriate courses in mathematical statistics.

Students planning to specialize in economic theory should take a third semester of calculus and 6E:212 Mathematical Economics II.

Major Area Components

Each student chooses a major area of study in addition to the core courses. A major area consists of a minimum of 24 semester hours of coursework comprising intensive study of a field and additional courses which supplement the major field and provide the student with sufficient breadth to understand the relationship between his or her own specialty and other related fields. The major area must include at least one course (3 s.h.) in economic history or the history of economic thought.

The student must maintain a 3.2 grade-point average or better in the field courses.

Examinations and Dissertation

A written qualifying examination, covering theory, mathematical economics and statistics, is given at the end of the first year of the Ph.D. program. Students who pass the examination may continue in the Ph.D. degree program; those who do not may pursue the M.A. degree.

After passing the core courses, the student takes a written comprehensive examination covering microeconomics, macroeconomics, and econometrics. A student passing the examination proceeds to the prospectus stage of the Ph.D. program; a student who does not may complete an M.A. program.

A dissertation prospectus must be presented within ten months of passing all the written comprehensive examinations. Satisfactory oral defense of the dissertation research completes the Ph.D. program.

Teaching and Research

Teaching and/or directed research are vital to the training of candidates for the Ph.D. degree in economics. The Ph.D. degree requires candidates to engage in teaching/research for at least 8 terms (semesters or summer sessions). The typical amount of service in each term is 20 hours per week.

Courses

Primarily for Undergraduates

Note: 6E:1 and 6E:2 may be taken in either order or they may be taken simultaneously; they satisfy the social science core requirement.

6E:000 Cooperative Education Training Assignment **0 s.h.**

6E:1 Principles of Economics **4 s.h.**
Organization and workings of modern economics system; role of markets, prices and competition in the promotion of economic welfare; alternative systems; international trade. Prerequisite: satisfaction of University rhetoric requirement.

6E:2 Principles of Economics **4 s.h.**
National income and output, employment and prices; money and credit; government finance; monetary and fiscal policy; economic growth and development; international finance; economic systems. Prerequisite: satisfaction of University rhetoric requirement.

6E:7 Contemporary Economic Problems and Policy **2-3 s.h.**
Emphasis on interpretation and analysis of latest economic events, problems and policy issues. Not open to students who have taken 6E:1 or 6E:2. No prerequisites.

Economic Analysis and Policy

6E:100 Price, Employment, and Production Theory **3-4 s.h.**
Role of markets and price determination under various conditions; national income analysis, employment, growth, and economic policy; alternative economic systems. Accelerated introduction to principles of economics, not open to students with previous economics courses. Prerequisite: senior or graduate standing.

6E:103 Microeconomics **3 s.h.**
Economic theory of consumer behavior, producer behavior, and role of markets in coordinating economic decisions; conditions for efficient resource allocation by market mechanism. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:105 Macroeconomics **3 s.h.**
Measurement of national product, unemployment, and inflation; determination of national income and the price level; analysis of the use of stabilization policies; explanation of the dynamics of inflation and the problem of stagflation. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:111 Labor-Manpower Economics **3 s.h.**
Impact of industrialization on labor markets, with analysis of resulting problem areas; labor supply, training, and allocation; wages and fringe benefits; working hours and conditions; economic insecurities; role of labor market institutions in economy. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:113 Health Economics **3 s.h.**
Structure of America's medical care industry and applications of economic analysis to its problems of production, pricing, and distribution; impact of insurance, and the role of private and governmental planning agencies. Prerequisite: 6E:1 and 6E:2 or consent of instructor.

6E:115 Economics of Human Resources **3 s.h.**
Readings in recent application of economics to human beings considered as an economic resource; particular emphasis upon examination of discrimination in labor markets. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:117 Money and Banking 3 s.h.
Monetary institutions, theory, practice, and policy with respect to the role of money in the determination of income, employment, and prices in domestic and world economy. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:119 Economics of the Government Sector 2-3 s.h.
Economic functions of government in modern economies; economic decision-making in government; budgetary processes; effects of government expenditures and taxation upon allocation of resources, distribution of income, economic growth and stability. Prerequisites: 6E:1 and 6E:2 or consent of instructor.

6E:123 Political Economy of the Military-Industrial Complex 3 s.h.
Examines recent literature on the theory of the "military-industrial complex," contrasts these views with those of the classical school on national security affairs; traces historical development of the "complex," attempts to relate it to causes and consequences in political, economic, and social dimensions. Prerequisite: 6E:1 and 6E:2 or senior standing.

6E:125 International Economics 3 s.h.
Foreign exchange and balance of payments; international monetary arrangements and policy; theory of international trade; role of tariffs and restrictions in international trade. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:127 Natural Resources in the World Economy: Control and Conflict 2-3 s.h.
Economic issues connected with the "new scarcity" in natural resources; analysis of supply and demand conditions, market control, implications for economic growth and development, role of technological advancement, actual and potential conflict among nations. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:129 Economic Development: Underdeveloped Areas 3 s.h.
The problem of underdevelopment in Third World countries; examination of theories and policies of economic development. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:133 Economic Growth and Environmental Decay 3 s.h.
Causes and consequences of economic growth in developed countries; possible resource and energy limitations on economic growth; measurement of economic growth and progress; current environmental and resource use problems; policies for environmental protection. Prerequisites: 6E:1 and 6E:2 or senior standing or consent of instructor.

6E:135 Regional and Urban Economics 3 s.h.
Theory of location and regional development; factors influencing location of production, city location and hierarchies, land-use patterns, and measurement and change in regional economic activity; public policy issues in regional and urban development. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:137 Problems in Urban Economics 3 s.h.
Application of economic analysis to urban problems; examination of role of city and urban economy; problem areas examined include migration, race and poverty, housing, land use, transportation, urban finance, pollution, and public policy for urban development. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:141 Industrial Organization 3 s.h.
Structure of major American industries and effectiveness of public policy; development of theories of market behavior, welfare economics, and anti-trust laws. Prerequisite: 6E:1 or senior standing.

Economic History, Systems, and Ideologies

6E:151 American Economic History 3 s.h.
Analysis on basis of a theoretical model cast in terms of the process of economic growth and development; special emphasis on demographic factors, role of government, capital markets, structural change. Prerequisites: 6E:1 and 6E:2 or senior standing. Same as 16:174.

6E:161 History of Economic Thought 2-3 s.h.
Economic concepts and doctrines examined against background of evolving urban-industrial society; classical, neoclassical, Keynesian, and modern economic thought. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:162 Orthodoxies and Radical Thought in Economics 3 s.h.
Conceptualization and classification; correspondence between fact and theory; historic interplay between orthodox and radical thought and policy. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:163 Comparative Economic Systems 3 s.h.
Functions performed by all economic systems; origins and attributes of some contemporary economies; modern capitalism and new industrial state. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:164 Galbraithian Economics 3 s.h.
Countervailing Power, The Affluent Society, The New Industrial State, Economics and the Public Purpose, and other works of John Kenneth Galbraith are analyzed in comparison to conventional economic thought. Prerequisites: 6E:1 and 6E:2 or senior standing.

6E:165 Comparative Labor Movements 3 s.h.
Historical and economic treatment of labor movements in England, Australia, Scandinavia, Germany, Russia, United States; assessment of labor movement theories; economic and political impacts of labor unions and collective bargaining. Prerequisite: 6E:111 or senior standing.

6E:166 The Political Economy of Socialism 3 s.h.
Evolution of socialist economic thought; contemporary models of socialist economy; existing socialist systems (USSR, Eastern Europe, China, Cuba); recent reforms and contrasts with welfare capitalism. Prerequisites: 6E:1 and 6E:2 or consent of instructor.

Quantitative Methods

6E:180 Mathematics for Economists 3 s.h.
Mainline concepts of differential and integral calculus for functions of a single variable; condensed treatment of linear algebra and Euclidean geometry; selected topics from differential calculus for functions of several variables with applications to economics. Prerequisite: at least one, preferably two, semesters of calculus.

6E:182 Introduction to Econometrics 3 s.h.
Introduction of statistical approach to economics; simple and multiple linear regression, identification problems, survey of applications. Prerequisite: 22S:8 or equivalent.

6E:183 Statistical Methods in Econometrics 3 s.h.
Discrete and continuous random variables and their probability distributions; applications in economics; hypothesis testing and interval estimation; introduction to regression. Prerequisite: one semester of calculus, or consent of instructor.

6E:184 Methods of Quantitative Economics 3 s.h.
Theory of linear statistical models; simultaneous equations models; input-output analysis; introduction to time series analysis. Prerequisite: 6E:183 or 22S:120, or consent of instructor.

M.B.A. Courses

6E:190 Consumer and Firm Behavior 2 s.h.
Models of consumer and firm behavior with applications; market equilibrium and market structure.

6E:191 National Income Analysis 2 s.h.
Measurement of economic activity; determinants of national income; investment and business fluctuations; money, prices, and inflation; monetary and fiscal policy.

For Advanced Undergraduates

6E:197 Senior Thesis in Economics arr.
Primarily for honors students. Prerequisite: consent of instructor.

6E:198 Senior Seminar in Economics arr.
Prerequisite: consent of instructor.

6E:199 Readings and Independent Study in Economics arr.
Prerequisite: consent of instructor.

Primarily for Graduates

Qualified undergraduate students permitted to work in courses listed for graduate students with consent of the chair.

6E:200 Topics in Economics 1 s.h.
Introduction to the faculty, programs, perspectives, and areas of specialization in the Department.

6E:201 National Income Analysis 3 s.h.
Foundations of macroeconomic thinking; contemporary theory with respect to national income accounting, aggregate demand, consumption, investment, employment, and output; economic forecasting; economic policy for stable growth.

6E:202 Price Theory 3 s.h.
Theory of consumer, theory of firm; theory of markets; general equilibrium and welfare economics.

6E:203 Microeconomics I 3 s.h.
Fundamental axioms of rational choice under certainty and risk; revealed preference theory; classical demand theory; production, costs, and theory of the firm; perfect and imperfect markets; general equilibrium and optimality. Prerequisite: 6E:103 or consent of instructor.

6E:204 Macroeconomics I 3 s.h.
Income and product measurement; models of income determination; analysis of commodity, money, and labor markets; theory of economic policy; models of economic growth; dynamics of inflation and inflationary expectations.

6E:205 Microeconomics II 3 s.h.
Competitive equilibrium, existence, and stability; Pareto optimality and core of competitive economy; growth and income distribution in two-sector model; duality; classical and recent developments in welfare economics.

6E:206 Macroeconomics II 3 s.h.
Microfoundations of macroeconomics; neoclassical, neo-Keynesian, monetarist macroeconomic models; disequilibrium macroeconomic models; growth models with two or more assets.

6E:207 History of Economic Thought I 3 s.h.
Economic doctrines and social and political background influencing development of economic thought; ancient and medieval economics, mercantilism, physiocracy, classical economics, historical school, and socialist doctrines. Prerequisite: consent of instructor.

6E:208 History of Economic Thought II 3 s.h.
Development of marginalist, neoclassical, and Keynesian thought; American economic thought including institutional economics; varieties of socialist economies; ultraliberal tradition. Prerequisite: consent of instructor.

6E:209 Theory of Choice 3 s.h.

6E:210 Theory of Production 3 s.h.

6E:211 Mathematical Economics I 3 s.h.
Algebra of linear inequalities; separation theorems; linear programming theory, applications; choice under risk; elements of probability theory; expected utility hypothesis; risk aversion. Prerequisite: 6E:180.

6E:212 Mathematical Economics II 3 s.h.
Theories of cooperative and noncooperative games; applications. Prerequisite: 6E:211.

6E:213 Mathematical Economics III 3 s.h.
Existence, uniqueness, and stability for systems of differential equations; applications to growth model; topics in dynamic programming and optimal control. Prerequisite: 6E:211.

6E:221 Econometrics I 3 s.h.
Matrices in statistics through quadratic forms; single equation linear models; classical regressions, analysis of residuals, generalized regression, testing linear hypotheses on coefficients, autocorrelation, specification error, unrelated equations, dummy variables, autoregression. Prerequisite: 22S:120 or 6E:183.

6E:222 Econometrics II 3 s.h.
Simultaneous equations and time series analysis. Prerequisite: 6E:221.

6E:223 Econometrics III 3 s.h.
Study of selected topics including random coefficients, Bayesian econometrics, time series analysis, forecasting models. Prerequisite: 6E:222.

6E:231 Economic Development I 3 s.h.
Process of economic development in underdeveloped countries; emphasis on theories of development. Prerequisite: consent of instructor.

6E:232 Economic Development II 3 s.h.
Process of economic development in underdeveloped countries; emphasis on policy alternatives in development. Prerequisite: consent of instructor.

6E:233 Economics of Underdeveloped Regions: Latin America 3 s.h.
Economic development in Latin America; emphasis on current issues and problems, and on approaches to solutions. Prerequisite: consent of instructor.

6E:241 International Economics I 3 s.h.
Theory of foreign trade; tariff theory and policy; trade and growth. Prerequisite: consent of instructor.

6E:242 International Economics II 3 s.h.
Theory of foreign exchange; balance of payments adjustment; exchange controls; international investment. Prerequisite: consent of instructor.

6E:245 Monetary Theory I 3 s.h.
Microfoundations: models of demand for money; theory of barter, patterns of trade and media of exchange; informational frictions; labor contract theory; employment and inflation; policy formulation under uncertainty; influence of structural lags on policy effectiveness; rational expectations and discretionary stabilization policies.

6E:246 Monetary Theory II 3 s.h.
Money supply determination; money, price expectations, and interest rates; role of money in the economy and problems with monetary control. Prerequisite: consent of instructor.

6E:251 Labor-Manpower Economics 3 s.h.
Economics of labor market via evolving wage theory; models of institutional behavior in labor market; economic impacts of collective negotiation of employment conditions on total economy; consideration of alternative media.

6E:255 Health Economics 3 s.h.
Divergence from Pareto optimality in health care system; alternatives; modeling physician pricing and distribution decisions, hospital investment decisions and hospital inflationary mechanism; exploration of health-production technology and organizational forms and their implications for health planning. Prerequisite: consent of instructor.

6E:261 Economic History of the North American Economy 3 s.h.
Analysis of long-term growth patterns of American economy with reference to theories of economic development; discussion of recent research on demographic change, transportation systems, capital markets, technological change, scale of organization. Prerequisite: consent of instructor.

6E:262 Twentieth-Century United States Economic Growth 3 s.h.
Aggregative analysis of structural change and income growth in American economy 1900-1945; impact of monetary and fiscal policies; impact of two world wars; this period as setting for testing of formal economic hypotheses of commodity, factor, and financial markets. Prerequisite: consent of instructor.

6E:263 European Economic History 3 s.h.
European economic growth since Industrial Revolution; emphasis on population trends and labor force growth, evolution of capital markets, patterns of capital accumulation, resultant rates of economic growth; analyses of technological progress and growth of open economies. Prerequisite: consent of instructor.

6E:271 Industrial Organization I 3 s.h.
Modern theory of the firm; market structures; reasons for market failure; workable competition; detailed study of patterns of market structure in the U.S.

6E:272 Industrial Organization II 3 s.h.
Public policy issues in industrial organization; appraisal and critique of antitrust laws; regulation of public utilities and transportation in U.S. Prerequisite: consent of instructor.

6E:275 Urban Growth in Developing Countries 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Same as 113:275, 44:275, 34:275, 102:275, 42:275.

6E:281 Economics of the Government Sector: Taxation 3 s.h.
Role and effects of taxation; effects of major taxes upon allocation of resources, distribution of income, and economic growth and stability; debt finance as alternative to tax finance. Prerequisite: consent of instructor.

6E:282 Economics of the Government Sector: Expenditures 3 s.h.
Economic functions and effects of government spending; budgetary processes; benefit-cost analysis; theories of bureaucracy; voting models; centralized vs. decentralized decision-making; intergovernmental fiscal regulations. Prerequisite: consent of instructor.

6E:283 Federal Tax Policy 3 s.h.
Effects of federal taxation on resource allocation; income and wealth distribution and economic stability; evaluation of proposals for changes in federal tax system. Prerequisite: consent of instructor.

6E:284 State and Local Government Finance 3 s.h.
Economic functions of government; purposes and problems of multilevel, multi-unit government; state-local government finance in practice: description, evaluation, and prescription for change. Prerequisite: consent of instructor.

6E:291 Regional Economics 3 s.h.
Formulation of economic theory, analysis, planning, and policy in regional context; study of economics of location, resource mobility, demand and technology in dynamic spatial setting; design and use of regional accounts and economic models for regional analysis, policy formulation, and planning. Prerequisite: consent of instructor.

6E:292 Urban Economics 3 s.h.
Analytical aspects of urban economics; emphasis on urban growth in context of economic development, impact of private location decisions on patterns of growth; discussion of public economy of urban centers, and transportation in metropolitan areas. Prerequisite: consent of instructor.

6E:300 Readings in Economics arr.
Prerequisite: consent of instructor.

6E:301 Thesis in Economics arr.
Prerequisite: consent of instructor.

6E:302 Dissertation Seminar 1 s.h.
Prerequisite: approval of prospectus.

Advanced Graduate Seminars

6E:310 Seminar in Economic Theory arr.
Prerequisite: consent of instructor.

6E:320 Seminar in Econometrics arr.
Prerequsite: consent of instructor.

6E:330 Seminar in Economic Development arr.
Prerequisite: consent of instructor.

6E:340 Seminar in International Economics arr.
Prerequisite: consent of instructor.

6E:345 Seminar in Monetary Economics arr.
Prerequisite: consent of instructor.

6E:350 Seminar in Labor Economics arr.
Prerequisite: consent of instructor.

6E:355 Seminar in Health Economics 4 s.h.
Prerequisite: consent of instructor.

6E:360 Seminar in Economic History 3 s.h.
Prerequisite: consent of instructor.

6E:370 Seminar in Industrial Organization arr.
Prerequisite: consent of instructor.

6E:380 Seminar in Economics of the Government Sector arr.
Prerequisite: consent of instructor.

6E:390 Seminar in Urban and Regional Economics 3 s.h.
Prerequisite: consent of instructor.

College of Dentistry

Dean: James H. McLeran
Executive associate dean: John C. Montgomery
Associate dean for research and program development: Ian C. Mackenzie
Associate dean for academic affairs: Frederick M. Perkins
Assistant dean for extramural affairs: C. Frederic Erbe
Assistant dean for clinical affairs: Thomas V. Gardner
Coordinator of student affairs: Ralph C. Appleby
Assistant dean for curricular affairs: Nelson S. Logan
Assistant to the dean: M.J. Brennan
Degrees offered: D.D.S., M.S.

The College of Dentistry is both administratively and physically an integral part of the University. It draws upon and contributes to the University's diverse resources, and its students enjoy all the advantages and privileges enjoyed by the general student body. The College benefits particularly from its cooperative relationship with the colleges of Medicine, Nursing and Pharmacy in the University Health Center, whose teaching, research and service activities have earned international recognition.

Basic Program in Dentistry

The basic educational program leading to the degree Doctor of Dental Surgery (D.D.S.) consists of at least three years of preprofessional study and approximately four years of study in the College of Dentistry. The dental curriculum consists of five basic units:

Basic Sciences

Gross anatomy; biochemistry; histology; physiology; general pathology; oral pathology; pharmacology; microbiology.

Restorative Dental Sciences

Gross, microscopic and radiographic dental anatomy; dental materials; endodontics; operative dentistry; fixed partial prosthesis; removable prosthesis.

Oral Medicine

Preventive dentistry; oral diagnosis; dental radiology; oral pathology; anesthesiology and pain control; oral surgery; periodontology. In addition, there are selected mini-courses in the Bioscience Options Program which are correlative between the basic and clinical sciences.

Community Dentistry

Ethics; epidemiology; nutrition; preventive dentistry; community health; principles of human behavior; dental economics; dental jurisprudence.

Pediatric Dentistry

Facial growth and development; pedodontics and orthodontics.

To achieve a close correlation of the basic sciences with clinical disciplines, the student is introduced to actual clinical work during the first year.

The second-year program includes additional correlative activities in the basic and clinical sciences, such as training in the effective coordination of auxiliary personnel. This instruction is in conjunction with the dental auxiliary utilization program.

Third-year dental students rotate through a series of "clerkships" which gives them meaningful exposure to each of eight clinical disciplines.

Fourth-year dental students are involved in the delivery of comprehensive dental care in an environment which closely simulates conditions in private dental practice. Fourth-year students also are exposed to various extramural health programs at state and University Hospitals and the State Department of Health.

There are available preceptorships in which fourth-year dental students assist in selected dental offices throughout Iowa. The preceptorships expose students to facets of dentistry usually not observable in an academic setting, such as practical business management procedures, appointment-book control, the dynamics of presenting treatment plans to private patients and the relationship of the dentist to the community.

Program Flexibility

A dental student may satisfy departmental requirements by examination in lieu of course participation. The time thus gained may be used in a number of productive ways, including to progress through the curriculum at a faster rate.

Promotions and Graduation

Student promotions and graduation are determined by the Academic and Professional Performance Committee appointed by the Dean from each of the broad areas of basic sciences, preclinical sciences, clinical sciences and from the other academic areas of the College. The performance committee may recommend to the Dean that a student withdraw from the College or repeat specific courses when the student is deemed generally unprepared to be promoted or to enter the dental profession.

Committee for Appeals

When a student has been asked to withdraw from the College, or desires special consideration on problems concerning promotion or graduation, he or she may appeal this decision to the Dean. All appeals shall be heard by an ad hoc committee appointed by the Dean. The committee considers such matters as student scholastic achievement, promotion, absences and general fitness to enter the dental profession. The decision reached by the ad hoc appeals committee is final.

State Board of Dentistry Licensure Examination

The states of Kansas, Colorado, Missouri, Oklahoma, Iowa, Wisconsin, Nebraska, Minnesota, Wyoming, North Dakota and South Dakota have joined in the formation of the Central Regional Dental Testing Service to replace clinical examinations previously given by the states individually. These examinations are administered at several testing sites located at schools of dentistry within the region. Examination dates are determined by the Central Regional Dental Testing Service and are available from its administrative secretary. Successful completion of requirements of the Central Regional Dental Testing Service will be accepted by the member states for a five-year period in lieu of their individual clinical requirements.

Facilities

The Dental Science Building, a major unit in an expanded Health Center, enables the College to accelerate its research activities, and facilitates the development of interdisciplinary communication in Health Center teaching, research and patient-care activities. The Health Center includes the colleges of Medicine, Nursing and Pharmacy; a Basic Sciences Building, University Hospitals and a Health Sciences Library. The Health Sciences Library houses all of the University's special health science holdings, including the College of Dentistry's collection of more than 10,000 volumes on dentistry and allied scientific subjects, and the more than 283 professional journals the College currently receives.

The Dental Science Building consists of two connected four-story wings located on either side of a mall. The south wing is devoted to clinical teaching, with various departmental clinic facilities, support laboratories, clinical research space, offices, and an automated learning center. The north wing houses a variety of teaching, administrative, and research facilities, including teaching laboratories, research laboratories, administration area, an audiovisual production center and the programs in community dentistry.

Student Organizations

All dental students are eligible for membership in the American Student Dental Association. Students who rank in the upper 12 percent of the senior class are eligible for Omicron Kappa Upsilon, national scholastic honorary dental society. Two national dental professional fraternities, Delta Sigma Delta and Psi Omega, have chapter houses at Iowa, and both have wives' auxiliaries. There is also a Dental Student Wives Club.

Expenses

The College of Dentistry maintains a Supply-Sterilization-Instrument Management System (S.S.I.M.S.) that provides the student with most of the instruments and supplies necessary throughout dental training. The instrument usage fee for the program leading to the D.D.S. degree is payable in installments over the first three years of the program.

In addition, a fee for expendable laboratory supplies will be charged for each of the first two years. A $100 breakage fee must also be deposited. The deposit is refundable upon graduation or termination of enrollment.

Financial Assistance

Under the Health Professions Scholarship and Loan Programs, eligible dental students may borrow up to $3,500 each year of their undergraduate professional studies. Preference is given to students who would not otherwise be able to finance health profession studies. Loans are issued at low interest rates and are repayable over an extended period of time after the recipient concludes the course of study. There are also provisions for forgiveness of portions of the loan in consideration of the graduate's selection of location of service in an area where there is a shortage of dentists.

The Armed Forces Health Professions Scholarship Program is open to dental students from the army, navy and air force. For information on this program, inquire at the College Dean's office.

A number of short-term loans are available from the American Dental Association, the Iowa Dental Association, the Kellogg Foundation, the Iowa Dental Achievement Fund and other sources, to help students in emergency situations.

Dental students are also eligible for much of the assistance provided through the University's Office of Student Financial Aids. This includes opportunity for part-time employment.

For further information on financial assistance available to dental students, see the "Scholarships and Loans" section of the *Catalog* or inquire at the Office of Student Financial Aids.

Admission

Applications are accepted beginning June 1 of the year prior to the year for which application is made. The closing date for applications is December 1 for the class entering the College of Dentistry the following August.

The prospective dental student is encouraged to complete a program leading to a standard bachelor's degree before entering dentistry, or to consider a combined program which enables him or her to earn a standard bachelor's degree upon completion of the freshman year in dentistry. Preference will be given to applicants who have a bachelor's degree or who have completed requirements for the degree in a combined program.

General Basis for Admission

Each applicant must submit a completed application form and official transcripts from all colleges attended to AADSAS (American Association of Dental Schools Application Service). The forms are available from the University Office of Admissions.

The basic academic requirement for admission to the College of Dentistry is the completion of no less than 94 semester hours of academic study at an accredited college.

Predental Studies

The predental program of study should include:

Rhetoric

Satisfactory accomplishment in English composition and speech commensurate with the academic requirements for a bachelor's degree.

Physics

One year (equivalent to eight semester hours), of which one-fourth must be laboratory work.

Chemistry

Two years (equivalent to 16 semester hours), including one year (equivalent to eight semester hours) of organic chemistry, with appropriate laboratory work in all courses, of which one-fourth must be laboratory work.

Biology

One year (equivalent to eight semester hours); this requirement may be satisfied by a one-year course in either general biology or zoology and botany (not botany alone), but in all cases one-half of the credit must be for laboratory work.

Electives

The applicant should also have sufficient coursework in the social sciences, philosophy, psychology, history, foreign languages and mathematics to provide a well-rounded educational background.

The dental admissions committee may waive or reduce some of the above requirements when the candidate for admission is considered outstanding in other respects. In exceptional circumstances, candidates with fewer than 94 semester hours of college work will be considered for admission if the applicant's performance and potential for the dental profession are considered outstanding.

Combined Liberal Arts-Dentistry Course

The provision for acceptance by the College of Liberal Arts of 30 semester hours of elective credit earned in any other college of the University makes it possible for the student who enters the College of Dentistry to obtain the bachelor's degree from the College of Liberal Arts upon successful completion of the freshman year in dentistry. To take advantage of this plan, the student must fulfill all specific requirements for the bachelor's degree, including the requirements for a major in some department or area of concentration. The successful completion of the last 30 hours in the College of Liberal Arts at The University of Iowa preceding enrollment in the College of Dentistry satisfies the College of Liberal Arts residence requirement.

Grade-Point Requirement

The applicant should have a cumulative grade-point average of at least 2.5 (A=4). In addition to the cumulative grade-point average, the admissions committee gives special consideration to the quality of the applicant's coursework in the predental sciences.

Interviews

Personal interviews are required of applicants for admission to the College of Dentistry.

Required Dental Admission Test

All applicants must complete the Dental Admission Test sponsored by the Council on Dental Education of the American Dental Association. Tests are given two times annually, and The University of Iowa is a testing center. Applicants must take the test no later than October in order to be admitted the following year. Applicants may obtain test application forms from the University or the American Dental Association. Test applications should be submitted well before the test deadline.

Deposit by Accepted Applicants

An accepted applicant is required to submit a deposit within 15 days after notification of favorable action on his or her application. This deposit is not refundable but is credited toward the first fee payment. An applicant who fails to make the deposit within the time specified forfeits a place in the entering class.

Physical Examination

Applicants accepted for admission are required to submit a satisfactory physical examination report to the University Student Health Service prior to registration.

Additional Admission Considerations

Fulfillment of the specific requirements listed for admission does not ensure admission to the College of Dentistry. From the applicants meeting minimum requirements, the admissions committee selects those who appear best qualified for the study and practice of dentistry. The committee considers applicants' academic averages, the scores on the required Dental Admission Test, and several other factors.

Since the available places in the freshman class of the College of Dentistry are limited, preference will be given to applicants who are residents of Iowa under the University's regulations on residence. If it is found possible to consider a limited number of applicants who are not residents of Iowa, preference will be given to nonresident applicants from states without dental schools, and to other nonresident applicants of outstanding scholarship and promise. Nonresidents whose grade-point averages are below 3.25 are discouraged from applying.

Graduate and postgraduate study programs leading to the Master of Science degree are offered by the College of Dentistry's departments of Dental Hygiene, Fixed Prosthodontics, Operative Dentistry and Endodontics, Oral Pathology and Diagnosis, Oral Surgery, Orthodontics, Pedodontics, Periodontics, Preventive and Community Dentistry, and Removable Prosthodontics.

Admission to any of the graduate programs requires satisfaction of all requirements for admission to the Graduate College.

possession of the Doctor of Dental Surgery degree or its equivalent, and departmental approval.

Departments also offer postgraduate programs of study designed as preparation for clinical specialty practice. These programs do not lead to an academic degree. Prerequisites for admission to the postgraduate programs are the same as for graduate programs. A certificate is awarded upon satisfactory completion of the postgraduate program.

Basic Sciences in the Dental Curriculum

The following science courses are offered by departments in colleges other than Dentistry, and are a required part of the dental curriculum:

60:101 Human Gross Anatomy for Dental Students	6 s.h.
60:112 General Microscopic Anatomy for Dental Students	4 s.h.
60:114 Oral Microscopic Anatomy and Embryology	2 s.h.
61:162 Dental Microbiology	5 s.h.
69:203 Principles of Human Pathology	arr.
71:111 Pharmacology for Health Sciences: Dental	5 s.h.
72:152 Mammalian Physiology	4 s.h.
99:161 Biochemistry for Dental Students	4 s.h.

Clinical Management Concepts

Faculty: *associate professor* Thomas V. Gardner
assistant professor Henrietta Logan
clinical assistant David Randall
assistant in instruction Joyce Ziethamel

112:167 Group Advocate Seminar 1 s.h.
Weekly series of meetings and student activities arranged to provide educational experiences in patient relations and treatment coordination utilizing computerized patient record summaries.

112:185 Clinical Admissions Emergency 1 s.h.

112:195 Advanced DAU 1 s.h.
Self-instructional learning program introducing the basic concepts and skills needed to effectively utilize chairside dental assistants; topics covered include principles of work simplification, body mechanics, instrument transfer, operating field maintenance, and interpersonal communications. Prerequisite: senior dental student.

Special Courses

112:165 Bioscience Options arr.
Selection from a series of elective mini-courses to emphasize the scientific basis of dental practice.

112:175 Program Abroad arr.
Opportunities for foreign dental studies are negotiated with the faculties of dental colleges abroad.

112:250 Advanced Dental Studies 1 s.h.

Dental Hygiene

Department chair: Pauline Brine
Faculty: *associate professors* Pauline Brine, Joanna Jenny, Nancy Sisty LePeau, Dorothy Rowe
assistant professors Ilene Biller, Hermine Hayden, Elizabeth Hunter, Patricia Rossman
adjunct assistant professor Kay Mescher
instructor Donna Rupp
Degrees offered: B.S., M.S.

Undergraduate Program

Qualified by education and licensure, the dental hygienist applies knowledge of the basic, social, dental, and clinical sciences in providing patient services for the prevention and control of dental disease.

The Bachelor of Science degree program in dental hygiene comprises two years of general education followed by two years of specialized study. Included in the general education requirements are courses in the basic and social sciences. These courses provide the student with educational preparation in disciplines relevant to specialized study in medical and dental sciences and in dental hygiene.

The curriculum is accredited by the Commission on Accreditation of the American Dental Association. Program graduates are prepared to take national and state dental hygiene licensure examinations which are required for dental hygiene practice.

The specialized courses of study are taken during the junior and senior years. In the junior year students are enrolled in 60:2 Human Microscopic Anatomy; 71:130 Intermediate Pharmacology; 82:61 Operative Dentistry Laboratory, Hygienists; 86:60 Introduction to Oral Pathology; 86:61 Oral Pathology for Dental Hygienists; 86:62 Dental Radiology for Dental Hygienists; 87:61 Anesthesia, Analgesia; 88:51 Dental Anatomy; and 7W:180 Special Topics in Instructional Design and Technology.

In addition, juniors learn the theory and clinical skills required for dental hygiene practice in 88:61 Dental Hygiene Core I and 88:62 Dental Hygiene Core II, which integrate content in dental anatomy with the theory and practice of clinical dental hygiene.

During the senior year students advance clinical skills — 88:85 Clinical Dental Hygiene. Part of this experience is received in 92:165 Periodontology. Each student is assigned to work with a graduate student of periodontics performing procedures on adults who have active periodontal disease. This experience not only advances the dental hygiene clinical skills, but provides both the hygiene and graduate dental students with a learning experience emphasizing the team approach.

During the senior year students also receive additional clinical experience in 86:86 Clinical Dental Radiology for Dental Hygienist. Weekly lectures and seminars reinforce clinical learning, 88:86 Seminar: Dental Hygiene Concepts and Practice.

Senior students also are enrolled in community dental health core 88:87 Practicum: Community Dental Health and 88:88 Seminar: Community Dental Health.

Courses traditionally taught as isolated subject-oriented units, such as dental health education, public health, and audiovisual media, are incorporated into an integrated core of learning. Learning emphasis is on the relationship between the underlying theory and practical application of community dental health. Weekly field experiences enable students to apply knowledge of human behavior, basic principles of communication skills, educational and research techniques to design, implement, and evaluate health care and educational programs.

Admission Requirements

Eligibility for admission to the professional program requires at least 60 semester hours of college coursework and at least a 2.25 cumulative grade-point average (2.4 for a transfer student). In fulfilling the 60-hour requirement, the student must satisfy general education requirements of the College of Liberal Arts and complete the following dental hygiene prerequisites:

Five semester hours (eight for transfer students) of zoology or general biology—37:3 Principles of Animal Biology;
Four semester hours of inorganic chemistry—4:7 General Chemistry I;

Four semester hours of organic chemistry, including biochemistry—4:8 General Chemistry II, 4:9 General Chemistry Laboratory;
Four semester hours of microbiology—61:164 Microbiology;
Three semester hours of nutrition—17:124 Nutrition Work with Children;
Four semester hours of psychology—31:1 Elementary Psychology;
Four semester hours of sociology—34:1 Introduction to Sociology: Principles;
Four semester hours of anatomy—60:1 Elementary Human Anatomy;
Four semester hours of physiology—72:13 Introduction to Human Physiology.

These prerequisites provide the educational basis for the dental hygiene courses of study. Completion of a two-year associate degree program in dental hygiene, therefore, does not provide an appropriate background for transfer into the baccalaureate program at Iowa.

Students begin the professional program in dental hygiene in the fall only. Students enrolled in the University of Iowa College of Liberal Arts need submit only the dental hygiene application. Transfer students must submit both College of Liberal Arts and dental hygiene applications. After submitting their dental hygiene applications, all applicants are interviewed by the dental hygiene admissions committee.

Graduate Program

Although the need for qualified educators in dental hygiene continues, the graduate faculty within recent years has recognized the need for preparing graduates to contribute toward the advancement of new knowledge in dental hygiene. This has resulted in revision of graduate program goals placing increased emphasis on the acquisition of advanced scientific knowledge in the biological and social sciences and basic knowledge of and experience in conducting research.

The curriculum design provides the student with major concentration in advanced dental hygiene theory. In the biological field, this consists of the pathophysiology of dental plaque including plaque microbiology and biochemistry, and the relationship of plaque to caries and periodontal disease; the response of the host to dental plaque, emphasizing immunological mechanisms; and the prevention of dental diseases by immunization and antimicrobial agents.

In the social science area, students will read literature on the relationships between the individual, the family and community and oral health outcomes, consider how oral health could be improved in simulated community settings, and learn how social science research methodology can be utilized to study problems relevant to the profession of oral hygiene and to oral health.

Study in the educational field includes trends in dental hygiene with emphasis on dental hygiene education; elements of curricular design; and the theory and application of didactic and clinical teaching in dental hygiene.

Although students may begin the program during the fall, spring, or summer session, enrollment at the beginning of the summer session is preferred. Applications, transcripts, and Graduate Record Examination (GRE) scores should be submitted at least six months prior to the semester admittance is desired. Most students should expect to take two academic years to complete degree requirements.

Approximately 12 semester hours are assigned to courses to advance knowledge in dental hygiene and 10 semester hours to research methodology and to thesis preparation and defense. The remaining 12 hours are to include electives in the biomedical and social sciences.

Elective coursework related to the biomedical sciences includes microbiology, histology, biochemistry, oral pathology, and periodontology.

Electives emphasizing population research and the social, economic, and political aspects of health include epidemiology, medical sociology, health care planning, and the sociology of change.

Students are also strongly encouraged to consider taking electives in higher education, such as educational measurement, theories of learning, and administration.

After the student completes his/her coursework and thesis is accepted, the candidate must pass a comprehensive examination over the graduate program of study.

Courses required in Dental Hygiene are 88:201 Seminar: Dental Hygiene Literature Review; 88:202 Evaluation of Dental Hygiene Research; 88:203 Research: Dental Hygiene; 88:204 Selected Topics in Dental Hygiene Education; 88:205 Sociomedical Topics in Oral Health Care; and 88:206 Thesis: Dental Hygiene. Other required courses are 111:212 Statistical Methods in the Biomedical Sciences, or 7P:143 Introduction to Statistical Methods; and 111:224 Design and Evaluation of Research Dentistry.

Graduate Admission Requirements

Applicants for admission are subject to the general rules of the Graduate College. Departmental requirements include an acceptable score on the Graduate Record Examination and a 2.8 minimum undergraduate cumulative grade-point average (A=4). The undergraduate education of the applicant should include courses equivalent to those in the undergraduate dental hygiene major at The University of Iowa.

Candidates for admission must submit official transcripts of all undergraduate academic records, an application for admission, and Graduate Record Examination scores to the Office of Graduate Admissions, Calvin Hall. These materials must be received before the candidate's application can be processed. Application for admission and information on the Graduate Record Examination can be obtained from the Office of Graduate Admissions.

Special Programs

Through an independent study program, students can explore additional career options in dental hygiene or enrich their educational background in a dental hygiene-related field of study. For example, a student interested in clinical research may become involved in a faculty-directed research project. Others considering graduate programs in public health or dental hygiene education may, under the direction of faculty, conduct projects related to these interest areas.

Facilities

University of Iowa dental hygiene majors receive their professional preparation in the University's new Dental Science Building. This building is part of the University of Iowa Health Center complex, one of the nation's outstanding health science teaching, research, and patient care facilities.

Financial Aid

In addition to financial assistance available to University students in general, there are a limited number of loans specifically for dental hygiene students. These loans are based on assessment of the student's academic record as well as financial need.

Courses

For Undergraduates

88:51 Dental Anatomy 1 s.h.
Detailed study of human dental anatomy, morphology, and function. Includes dental nomenclature, eruption patterns, and occlusion of primary and permanent dentitions.

88:61 Dental Hygiene Core I 8 s.h.
Introduction to dental hygiene theory, clinical skills, head and neck anatomy, and dental disease. Didactic and clinical experiences are related to complete oral prophylaxis and dental hygiene procedures.

88:62 Dental Hygiene Core II 5 s.h.
Emphasis on application of dental hygiene theory in the performance of intermediate clinical dental hygiene and oral disease control procedures.

88:85 Clinical Dental Hygiene 7 s.h.
Practice of advanced dental hygiene procedures with emphasis on providing comprehensive preventive and clinical services.

88:86 Seminar: Dental Hygiene Concepts and Practice 4 s.h.
Review of current research and advances in preventive procedures; ethical, legal, and social responsibilities of health care providers; current and extended roles in dental hygiene practice.

88:87 Practicum: Community Dental Health 9 s.h.
Knowledge of dental health, dental care, educational and research techniques are applied in field experiences to design, implement, and evaluate health care and educational programs.

88:88 Seminar: Community Dental Health 4 s.h.
Study of factors influencing health, health care delivery and utilization. Dental epidemiology, need and demand for dental care, dental care system, and research techniques are emphasized.

88:111 Independent Study arr.
Designed for students who plan to pursue additional study or to explore career interest in dental hygiene education, research or public health.

For Graduates

88:201 Seminar: Dental Hygiene Literature Review arr.
Analysis of dental hygiene literature on political, sociological, and educational factors influencing trends and current status of knowledge in field of dental hygiene.

88:202 Evaluation of Dental Hygiene Research 4 s.h.
Evaluation of biological and clinical research in dental hygiene and related fields, and the effects of research findings on theory and practice of dental hygiene.

88:203 Research: Dental Hygiene 3 s.h.
Literature review, selection of research topic, finalization of protocol design for master's thesis.

88:204 Selected Topics in Dental Hygiene Education 3 s.h.
Theory and research applied to specific areas of dental hygiene education in clinical, didactic, or field settings. Content emphasis on theoretical and methodological issues.

88:205 Socio-Medical Topics in Oral Health Care 4 s.h.
Evaluation of current research conducted on cultural, sociological, and psychological factors influencing oral hygiene and oral health care.

88:206 Thesis: Dental Hygiene arr.
Completion of thesis preparation and defense.

Endodontics

Acting department head: Mohamed Khowassah
Faculty: *professors* Arne M. Bjorndal, Mohamed Khowassah
assistant professor Lanny V. Kample
Degree offered: M.S.

Predoctoral Program

Coursework and clinical experiences in endodontics are of vital importance in the overall education of a dental student.

Preclinical endodontics is taught during the sophomore year and includes both didactic and laboratory courses.

In clinical endodontics, the student studies both normal and pathological conditions of the dental pulp, emphasizing the areas of prevention and diagnosis of pulpal disease. Students treat endodontic patients under direct supervision of the Department's faculty and staff.

Graduate Program in Endodontics

The graduate program offered by the Department of Endodontics is designed to prepare qualified dentists for skills and competence in the practice of endodontics. It also prepares the candidate for a career in dental education and research.

The Department offers two types of graduate (post-D.D.S.) programs.

The Master of Science degree program requires a minimum of 40 graduate credit hours, including an original research project and thesis. The student follows a plan of study which may involve a total of 60 semester hours.

The certificate program requires no formal thesis. The candidate is expected to write a scientific paper of publishable quality, based on original research. The certificate program involves course study for up to 60 semester hours of credit. An individual plan of study is prepared for each student.

Both programs are for a minimum of two calendar years, and only full-time students are admitted. Completion of the program requires satisfactory performance in a comprehensive written and/or oral examination which is of a functional character and does not duplicate semester examination.

These programs satisfy the training requirements for eligibility for the American Board of Endodontics.

The specific goals of these programs are to allow the dentist to develop his skills and acquire a broad knowledge of the specialty of endodontics for teaching and practice purposes; to gain sufficient knowledge and experience in the educational process so that he or she may function confidently as a dental educator; to recognize the value of the pursuit of academic research; and to develop the ability to plan, conduct, and report the results of research investigations.

An applicant for the graduate programs in Endodontics must be a graduate of an accredited college of dentistry and must comply with the requirements for admission to the Graduate College of The University of Iowa.

The graduate programs in Endodontics normally begin July 1 of every year. However, it is also possible to start a program at the beginning of either the spring semester or summer session. Applications should be made no later than two semester periods in advance of anticipated starting date.

Students who have met the requirements for admission to the Graduate College must also be accepted into the program by the faculty of the Department of Endodontics. A personal interview with the applicant may be requested.

Each student in the program must maintain a grade-point average of 3.0 to receive a certificate or degree. A student who falls below this level will be allowed one semester to attain it. The circumstances creating the deficiency will receive careful consideration.

Students enrolled in the graduate programs in Endodontics shall not involve themselves in private practice enterprises outside the college. A student who does so will be asked to obligate himself or herself exclusively to the program or the practice.

Persons applying to the graduate program in Endodontics must be able to support themselves financially for the time required to complete the program.

D.D.S. Program

83:140 Endodontics **2 s.h.**
Lectures, seminars, and laboratory projects designed to give understanding of basic principles, concepts, and technical procedures necessary for treatment of pulpal problems in human teeth.

83:150 Clinical Endodontic Practice **4 s.h.**
Clinical endodontics practice; clinical symptoms evaluated; discussion of treatment of each individual case followed by student's practical application on simple suitable cases. Prerequisites: 83:140, third year.

83:170 Selected Topics in Endodontics **1 s.h.**

Primarily for Graduates

83:225 Endodontic Literature Review I **1 s.h.**
Reading of the past and present of endodontic literature.

83:226 Endodontic Literature Review II **1 s.h.**
Introduction to modern methods of endodontics and discussion of dental materials used in endodontics.

83:227 Endodontic Literature Review III **1 s.h.**
Reading and discussion of biomechanical endodontic research.

83:228 Endodontic Literature Review IV **1 s.h.**
Research papers, evaluations and discussions of methods and materials, and their use in endodontics.

83:230 Research in Endodontics **arr.**
Topic selection; protocol preparation and starting investigation; completed research investigation and gathering of data; and writing of thesis and defense before thesis committee.

83:231 Thesis Preparation in Endodontics **3 s.h.**

83:240 Endodontics Surgery Conference **2 s.h.**
Evaluation of endodontic cases that require surgical treatment; discussion of different treatment methods and photographics; graduate students present their surgery cases before and after treatment to the faculty; discussion of surgical approach to endodontic treatment.

83:241 Advanced Clinical Endodontics **arr.**
Clinical treatment of patients, progressing from simple to more advanced, finally to implants and hemisections; students expected to take this course every semester.

83:250 Seminar in Endodontics I **2 s.h.**
Review of pulp biology, histochemistry of tooth and hard structure; basic philosophy and concept of endodontics; review of basic endodontic techniques.

83:251 Seminar in Endodontics II **2 s.h.**
Biological concepts of endodontics in relation to selected clinical cases of varying difficulties; diagnostic and prognostic procedures leading to treatment planning and alternative treatment procedures of clinically difficult cases.

83:252 Seminar in Endodontics III **2 s.h.**
Clinical endodontic procedures as they relate to difficult endodontic cases; evaluation of success and failure of endodontic cases in relation to treatment procedures followed; surgical endodontics, concepts, techniques.

83:253 Seminar in Endodontics IV **2 s.h.**
All areas of dental treatment related to endodontics; complex endodontics cases and difficult patient conditions; relationship of endodontics to other dental specialties, by guest lecturers.

83:255 Practice Teaching in Endodontics **arr.**
For students interested in teaching in dentistry, especially in endodontics; organizing a course, practice teaching in undergraduate clinics.

Family Dentistry

Division head: Daniel L. Hall
Faculty: *associate professor* Daniel L. Hall
assistant professors Robert J. Connor, Larry J. Crabb, Howard W. Dedmon, John V. Doering
instructors H. Douglas Hall, Vincent D. Williams

Family Dentistry is responsible for the senior dental student's final synthesis of academic experiences. The major goal is the integration of previously-learned clinical skills into a well-organized and systematic approach to the comprehensive treatment of dental patients. The experience encompasses approximately three-fourths of the senior year.

Students spend four and a half days a week in a clinical setting, where they gain experience in total patient management and care. Their didactic coursework builds on the previous year's education. All areas of clinical and didactic instruction, patient awareness, and sensitivity to patients' needs are stressed.

The Department's two practice management courses—one lecture, the other clinical—prepare the student to make practice location selections as well as manage the business aspects of a dental office.

Courses

114:185 Practice Management Lecture **1 s.h.**
Dynamic managerial aspects of management principles, personnel management, and economics of dental practice, leadership styles, communication, model, and decision making with discussions of developing a dental practice; all subjects are designed to promote effective and efficient operation of a dental practice.

114:186 Clinical Practice Management **2 s.h.**
Application of the principles of management of a dental office in a clinical environment of multiple auxiliaries and dental facilities, and emphasizing the importance of efficiency and organization in delivering high quality care to patients.

114:190 Family Dentistry Lectures **1 s.h.**
Synthesis, analysis and evaluation of prior acquired knowledge and experience for an integrated and comprehensive system of dental health care management.

114:191 Family Dentistry Clinic **arr.**
Clinical application of previous cognitive, psychomotor and affective learning experiences toward development of an integrated and comprehensive system of dental health care management.

114:193 Group Practice Seminar **1 s.h.**
Dynamic principles of a model dental group practice, with discussions of treatment progress of patients assigned to the group; methods are explored and developed to encourage the effectiveness and efficiency of total patient treatment by members of the group.

114:194 Specialties in General Practice **1 s.h.**
Guest lecturers from the various dental specialties provide current techniques and findings in their areas and discuss applications for the general practioner; information about selection of graduate specialty programs.

114:195 Diagnosis and Treatment Planning Seminar **1 s.h.**
Students present documentation of diagnostic procedures used in the development of a treatment plan and sequence for selected clinical patients; seminar atmosphere challenges students to defend findings and recommendations.

Fixed Prosthodontics

Department head: Keith E. Thayer
Faculty: *professors* K.E. Thayer, C.W. Svare
assistant professors D.G. Drennon, D.F. Howe, R.D. Jordan
instructor K. Nakra
Degree offered: M.S.

Predoctoral Program

The Department participates in the D.D.S. program for dental students at all curricular levels. Preclinical courses at the first and second level prepare the student with a background in materials and techniques used in fixed prosthodontic treatment. Third-level students participate in a concentrated clinic program of patient treatment in the specialty area. The Department provides a consultation service to students in the fourth curricular level.

Graduate Program

The primary purpose of the Master of Science program in fixed prosthodontics is to train and prepare dentists for careers in fixed prosthodontics education and/or research. It is also adaptable for individuals wishing to further prepare themselves for private practice in fixed prosthodontics. The program satisfies the formal training requirements for eligibility for the American Board of Prosthodontics examination.

Degree Requirements

A research project and thesis are required for the master's degree in fixed prosthodontics. The major emphasis of coursework is in fixed prosthodontic theory and treatment along with seminar courses in other

specialties of dentistry. A course in research methodology as well as a course in biostatistics or elementary statistical inferences in medicine is required. Coursework in the general area of basic science is also required. Oral and/or written exams are given during the regularly scheduled graduate degree exam period each year.

Any student who is unable to maintain the minimum 2.5 grade-point average during the first year of the program, or those individuals who elect to terminate their program after one year will be considered for issuing of certificates of attendance. Each student will be required to submit a manuscript suitable for publication in a nationally-recognized professional journal, based upon the student's research and/or thesis topic. He or she will be required to prepare one additional manuscript for publication on another topic.

Certificate Program

A certificate program offered by the Department provides more clinical experience and has no requirement for a research project and a thesis. The certificate also satisfies the formal training requirements for eligibility for the American Board of Prosthodontics examination.

Admission

The minimum requirements for admission into the program correspond to the minimum requirements for admission to the Graduate College of the University. In addition, the student must hold a D.D.S. or D.M.D. degree or its foreign equivalent. No advanced GRE is required.

Courses

81:120 Prosthodontic Materials Laboratory 1 s.h.
Manipulation and handling of dental materials is learned through fabrication of laboratory projects. Same as 84:120.

81:121 Dental Materials 2 s.h.
Relationship of atomic and molecular structure to physical and mechanical properties of basic dental materials is taught.

81:122 Occlusion I 2 s.h.
Interdisciplinary introduction to concepts of occlusion and mastication.

81:140 Fixed Prosthodontic Technique Lecture 3 s.h.
Lectures covering introduction to fixed prosthodontics, including definitions, materials, and techniques used in construction of various types of metal and porcelain fixed restorations.

81:141 Fixed Prosthodontic Technique Laboratory 3 s.h.
Technical procedures required in construction of fixed prostheses.

81:145 Occlusion II 1 s.h.
Practical application of the concepts of occlusion and mastication in the natural dentition.

81:160 Fixed Prosthodontics 4 s.h.
Seminars correlating previously acquired knowledge in biological and basic science and technique courses with clinical fixed prosthodontic procedures; practice in Dental Infirmary supplemented by individual supervision and demonstration.

Primarily for Graduates

81:225 Seminar: Fixed Prosthodontics 1 s.h.
Conferences and discussion on assigned research topics.

81:226 Seminar: Occlusion 1 s.h.
Conferences and discussion on assigned research topics.

81:227 Seminar: Dental Materials 1 s.h.
Conferences and discussion on assigned research topics.

81:228 Seminar: Fixed Prosthodontic Topics 1 s.h.
Assigned research topics for student seminar presentations.

81:230 Research: Fixed Prosthodontics arr.
Research design and collection of data on selected research project.

81:231 Thesis Preparation: Fixed Prosthodontics 3 s.h.
Prepared in accordance with regulations of the Graduate College.

81:240 Advanced Clinical Fixed Prosthodontics arr.
Student completes assigned cases in sequence of difficulty.

81:241 Technique Methods: Fixed Prosthodontics arr.
Advanced technical procedures.

81:242 Library Assignment: Fixed Prosthodontics arr.
Literature search and preparation of bibliographies and abstracts.

81:243 Practice Teaching: Fixed Prosthodontics arr.
Teaching assignments for credit.

Operative Dentistry

Department head: Wallace W. Johnson
Faculty: *professors* Kai Chiu Chan, Gerald Denehy
associate professor James Fuller
assistant professors Dan Boyer, Satish Khera, Dennis Tourney
clinical instructors Yvonne Chalkley, John Reinhardt
Degree offered: M.S.

Predoctoral Program

Coursework and clinical experiences in operative dentistry are fundamental to the overall education of a dental student. The operative curriculum is designed so that the didactic material presented relates closely to the laboratory and clinical experiences. The total program of instruction will provide the students with the necessary knowledge and experience to proceed independently in operative dentistry during the fourth year of training.

Graduate Program

The Department of Operative Dentistry offers a program of advanced training designed to prepare dentists for teaching, research, and practice. Since operative dentistry is not a specialty area of dentistry, there is ample opportunity in the graduate program for the student to pursue courses that may be of particular interest.

An applicant for this program must be a graduate of a recognized school of dentistry and must comply with the requirements for admission to the Graduate College of the University. An interview with the applicant may be requested.

Students may take the program for either a Master of Science degree or for a certificate in operative dentistry.

The following requirements must be met for the Master of Science degree:

Satisfactory completion of 48 semester hours of graduate level courses as specified in the plan of study for a Master of Science Degree in Operative Dentistry;

Preparation of an acceptable thesis based on original research. The student should plan to furnish his or her own financial support for the research and thesis; and

Formal defense of the thesis and examination of the candidate by an examining committee.

Courses

Operative Dentistry

D.D.S. Program

82:61 Operative Dentistry Laboratory for Hygienists 2 s.h.
Basic study of dental materials and methods by which these materials are applied to the restorative processes of operative dentistry.

82:120 Dental Anatomy Lectures 1 s.h.
Lectures and seminars concerning dental nomenclature, detailed anatomy, eruption patterns and occlusion of human primary and permanent dentition.

82:121 Dental Anatomy Laboratory 3 s.h.
Detailed study of human tooth morphology and function.

utilizing wax replacement method and natural and plastic teeth.

82:122 Operative Dentistry I 2 s.h.
Lectures and seminars concerning dental nomenclature, principles and design of cavity preparation; manipulation and placement of restorative materials; use of instruments in procedures pertaining to operative dentistry.

82:123 Operative Dentistry Laboratory and Clinic I 2 s.h.
Study and application of procedures involved in preparation of human teeth to receive dental restoration; students prepare all classes of cavities in natural and plastic teeth, use various dental materials in fabrication of restorations.

82:140 Operative Dentistry II Lecture 2 s.h.
Lectures and seminars concerning the principles and design of cavity preparations, the restoration of teeth, patient management, pain control and other aspects of clinical practice.

82:141 Operative Dentistry II Clinic 2 s.h.
Clinical training in operative dentistry on patients in operative clinic. Second year.

82:150 Operative Dentistry III 4 s.h.
Lectures, seminars, clinical demonstrations correlated with supervised patient treatment for each dental student in dental infirmary; students perform all forms of operative treatment for infirmary patients and gain understanding of physiological and esthetic importance of restorative treatment to patients. Third year.

Primarily for Graduates

Discipline Studies

82:225 Operative Dentistry Seminar I 1 s.h.
Literature review and discussion of past and present status of operative dentistry.

82:226 Operative Dentistry Seminar II 1 s.h.
Readings and discussion of the research relating to the biomechanical aspects of cavity preparations and their restoration.

82:227 Operative Dentistry Seminar III 1 s.h.
Readings and discussion of research relating to problems associated with maintaining dental pulp vitality.

82:228 Operative Dentistry Seminar IV 1 s.h.
Readings and discussions of the research relating to dental materials and their use in operative dentistry.

82:229 Action Research in Dental Teaching arr.

Research Program

82:230 Operative Dentistry Research I 3 s.h.
Topic selection, committee selection and literature review for research project, begin research protocol.

82:231 Operative Dentistry Research II 3 s.h.
Protocol completed, begin research investigation.

82:232 Operative Dentistry Research III 2 s.h.
Complete research investigation, gather and organize data.

82:233 Operative Dentistry Research IV 3 s.h.
Data gathered and organized, begin writing thesis.

82:234 Thesis Preparation in Operative Dentistry arr.
Complete thesis, defense before the committee, and comprehensive examinations.

Clinical Studies

82:240 Operative Dentistry Advanced Clinic I arr.
In-depth study of past and present restorative procedures; seminars, restorative assignments on a mannequin.

82:241 Operative Dentistry Advanced Clinic II arr.
Treatment of patient cases in the Operative Clinic; seminars and discussions of case problems; concentration on amalgam restorative procedures.

82:242 Operative Dentistry Advanced Clinic III arr.
Treatment of patient cases in the Operative Clinic; seminar discussions of case problems; concentration on cast gold restorative procedures.

82:243 Operative Dentistry Advanced Clinic IV arr.
Treatment of patient cases in the Operative Clinic; seminars and discussions of case problems; concentration on cast gold restorative procedures.

82:244 Operative Dentistry Advanced Clinic V arr.
Treatment of patient cases in the Operative Clinic. Seminars and discussions of case problems; concentration on esthetic resin restorative procedures.

82:245 Clinical Demonstrating arr.

Oral Pathology and Diagnosis

Head: Gilbert E. Lilly
Faculty: *professors* Gilbert E. Lilly, William H. Tade, Leslie Higa
professor emeritus Alton K. Fisher
associate professors Harold L. Hammond, William J. Hausler, Philip S. Horton, Clayton L. Shafia, Christopher A. Squire
assistant professor Francis H. Sippy
instructor Julie A. Howlett

Predoctoral Program

The primary objective of the Department is to provide instruction to dental students and other health-profession students in the etiology and natural history of diseases occurring in and about the oral cavity. Instruction includes the clinical, laboratory, radiographic and microscopic features of these diseases and their management. Instruction is provided in the physical evaluation of patients to identify systemic diseases and their influence on dental therapy and the influence of dental treatment on systemic diseases.

Graduate Program

Advanced instruction is available for graduate-level students in health sciences and related fields in preparation for speciality practice or careers in teaching and research.

Candidates for the Master of Science degree are expected to develop substantial ability for research into mechanisms of orofacial disease and should anticipate that considerable effort will be devoted to completion of an assigned research project and the thesis which will be based on it.

The tools for research will be determined for each student after consultation with the major adviser. Minimum requirements for completion of this program are 45 semester hours of graduate credit and a thesis. The required courses are:

60:206 Problems	2 s.h.
61:159 Pathogenic Bacteriology	4 s.h.
111:212 Statistical Methods in Biomedical Sciences	3 s.h.
69:201 General Pathology for Medical Students	5 s.h.
69:202 Systemic Pathology for Medical Students	7 s.h.
69:241 Clerkship in Pathology	2 s.h.
37:190 Seminar: Cell Structure and Function	2 s.h.
86:230 Research in Oral Pathology and Diagnosis	2 s.h.
86:250 Pathologic Processes	2 s.h.
86:256 Advanced Oral Pathology	3 s.h.
92:216 Dental Sciences Research Methodology	2 s.h.
68:199 Basic Otolaryngologic Science	4 s.h.

Since most graduates of advanced programs in oral pathology follow academic careers, students will participate in predoctoral teaching in the Department as part of their education.

Special Program

The certificate program in Oral Pathology combines academic studies with extensive laboratory practice of oral pathology under staff supervision, and requires a minimum of twenty-four months of full-time work for completion. Qualification for the certificate includes completion of all required courses with a passing grade, demonstration of competence in the practice of oral pathology and a satisfactory grade in a final comprehensive examination before an examination committee composed of members of the graduate faculty in the Department of Oral Pathology and Diagnosis.

Although additional courses may be elected if circumstances permit or require, required courses in this program are:

86:180 Topics in Oral Pathology	1 s.h.
86:200 Oral Pathology and Diagnosis Literature Review	2 s.h.
86:225 Oral Pathology and Diagnosis Seminar I	1 s.h.
68:199 Basic Otolaryngologic Science	4 s.h.

60:206 Problems 2 s.h.
86:226 Oral Pathology and Diagnosis Seminar II 1 s.h.
86:227 Oral Pathology and Diagnosis Seminar III 1 s.h.
86:240 Oral Pathology Advanced Clinic 3 s.h.
86:241 Oral Diagnosis Advanced Clinic 4 s.h.
86:242 Dental Radiology Advanced Clinic 1 s.h.
86:250 Pathologic Processes 2 s.h.
86:256 Advanced Oral Pathology 1 s.h.
69:201 General Pathology for Medical Students 5 s.h.
69:202 Systemic Pathology for Medical Students 7 s.h.
92:216 Dental Sciences Research Methodology 2 s.h.
69:241 Clerkship in Pathology 2 s.h.
87:215 Physical Diagnosis 2 s.h.

Facilities

The laboratories of the Department are equipped for training in histopathology, immunopathology, laboratory diagnosis and experimental pathology. Laboratories are available with facilities for investigation of ultrastructure of both soft and calcified tissues.

Admission Requirements

Applicants must have completed an accredited program leading to the D.D.S. or D.M.D. degree or its foreign equivalent, with a minimum cumulative grade-point average of 2.7 (4.0 scale), and must present satisfactory scores in the Graduate Record Examination Aptitude Test and in advanced tests on either biology or chemistry. Final decision on acceptance of any applicant meeting the requirements for admission will rest with the departmental staff. Prospective applicants are encouraged to discuss program requirements with the head of the Department prior to application.

Courses

86:60 Introduction to Oral Pathology 1 s.h.
Emphasis on basic processes of disease and the involvement of these processes in the creation of clinical disease. Required for dental hygienists.

86:61 Oral Pathology for Dental Hygienists 3 s.h.
Study of oral disease; provides basic information required to differentiate between normal oral tissues and disease of tissues; provides general understanding of pathologic processes involved in oral pathoses. Required for dental hygienists.

86:62 Dental Radiology for Dental Hygienists 1 s.h.
Intraoral techniques, radiation hygiene, film processing and mounting. First level.

86:85 Clinical Dental Radiology for Dental Hygienists 2 s.h.
Supervised clinical experience in taking dental radiographs, processing and mounting films. Second level.

86:120 Introduction to Diagnosis and Radiology 1 s.h.
Introduction to methods of clinical and radiographic examination and record keeping; correlation of basic and clinical sciences.

86:136 Oral Diagnosis and Treatment Planning 2 s.h.
Principles used in examining the oral cavity, correlation between oral and systemic conditions; use of diagnostic aids; translation of diagnostic aids; translation of diagnostic data to plans of treatment arranged in correct sequence. Second level.

86:135 Oral Pathology 4 s.h.
Lecture, conference, demonstration, laboratory course devoted to diseases involving orofacial organs. Second level.

86:145 Preclinical Diagnosis and Radiology 1 s.h.
Fundamental principles and techniques in diagnosis, radiology and clinical pathology required for clinical practice, presented in lectures, clinics, seminars. Second level.

86:155 Systemic Disease Manifestations 1 s.h.

86:160 Clinical Pathology 2 s.h.
Study and practice of diagnosis of orofacial diseases by clinical, laboratory, and radiographic methods. Material presented in clinical case analysis format. Third level.

86:161 Clinical Dental Radiology 1 s.h.
Supervised experience in taking and processing intraoral and extraoral radiographs, principles of radiographic interpretation. Third level.

86:162 Clinical Oral Diagnosis 1 s.h.
Practical application of diagnosis and treatment planning for patients. Third level.

86:180 Topics in Oral Pathology arr.
Lectures and demonstrations in concentrated areas of special knowledge in pathology. For advanced students in professional and graduate colleges.

Graduate Courses

86:200 Oral Pathology and Diagnosis Literature Review arr.
Assigned reading and preparation of abstracts. Prerequisite: consent of instructor.

86:225 Oral Pathology and Diagnosis Seminar I arr.
Expanded concepts in clinical diagnosis and patient evaluation are presented; emphasis on understanding and utilization of "state of the art" science and technology. Prerequisite: consent of instructor.

86:226 Oral Pathology and Diagnosis Seminar II arr.
Advanced radiology and histopathology diagnostic techniques and their interpretation and value in the management of clinical disease. Prerequisite: consent of instructor.

86:227 Oral Pathology and Diagnosis Seminar III arr.
Individual oral and systemic diseases, with attention to basic disease processes, diagnosis and management. Prerequisite: consent of instructor.

86:230 Research in Oral Pathology and Diagnosis arr.
Required for M.S. candidates but may be open to other qualified students whose interests coincide with available departmental research facilities. Includes thesis preparation. May be repeated. Prerequisite: consent of instructor.

86:240 Oral Pathology Advanced Clinic arr.
Diagnosis by laboratory methods with emphasis on surgical oral pathology. Histopathologic diagnosis of disease. Participation in operations of the clinical and histopathology laboratories. Prerequisite: consent of instructor.

86:241 Oral Diagnosis Advanced Clinic arr.
Advanced clinical, laboratory and radiographic methods will be applied in a hospital setting, to the evaluation, diagnosis and treatment of patients with complicated disease problems. Prerequisite: consent of instructor.

86:242 Dental Radiology Advanced Clinic arr.
Advanced intraoral and extraoral radiographic techniques, interpretation. Prerequisite: consent of instructor.

86:250 Pathologic Processes arr.
Basic processes of disease, with emphasis on cellular phenomena. Prerequisite: consent of instructor.

86:256 Advanced Oral Pathology arr.
Intensive study of diseases involving orofacial organs; content can be adapted to special interests of students; bibliographic research, biodynamic analysis of pathologic processes and diagnostic interpretation emphasized. Prerequisite: consent of instructor.

Oral Surgery

Department head: Merle L. Hale
Directors of graduate studies: Donald B. Osbon, Division of Oral Surgery; Gene A. Zach, Division of General Dentistry
Faculty: *professors* Merle L. Hale, James H. McLeran, John C. Montgomery, Donald B. Osbon, Gene A. Zach *associate professors* Alejandro Acevedo, Thomas V. Gardner, Leslie H. Higa, Sherwood Wolfson *assistant professors* John S. Brown, Sanford L. Klein, Lewis W. Williamson
Degree offered: M.S.

The Department of Oral Surgery combines clinical and didactic training on an individual basis to fit the interests, abilities and development of the student. Its predoctoral program is based in the College of Dentistry, with some clinical assignments in the Division of Oral Surgery at University Hospitals. Graduate study is based primarily in the Residency Training Program at University Hospitals.

Predoctoral Program

The predoctoral curriculum is designed to develop a foundation of professional knowledge, coupled with known surgical skills, to enable the student to diagnose and manage surgical problems related to the practice of general dentistry. Emphasis is placed on reinforcing high ethical standards and developing good surgical concepts, clearly indicating the moral responsibility assumed for the surgical problems undertaken. The clinical portion of the curriculum allows the student to develop surgical skills and apply the theoretical

knowledge acquired in the didactic courses. The theory and application of anesthesia-analgesia, intravenous sedation and nitrous oxide analgesia techniques are presented through didactic and clinical experiences.

Residency Program

The aim of the residency program in oral surgery is to provide preparation for specialty practice. The program is designed to combine clinical and didactic training on an individual basis. Every effort is made to adapt the program to the interests, abilities and development of the individual student; however, it is essential to meet certain fundamental requirements.

The recommendations of the Council on Dental Education of the American Dental Association, the Committee on Graduate Training of the American Society of Oral Surgeons and the American Board of Oral Surgery have been carefully considered in planning the structure and scope of training.

Requirements for the Master of Science degree may be completed during residency. The M.S. program comprises a three-year course of integrated didactic and clinical study, and may include a research project and the preparation of a thesis.

Residency

The residency period covers three years of hospital training, providing an orientation to hospital procedures, integration of basic and clinical sciences, acquisition of the principles of surgery and familiarization with the various aspects of health services.

Competence in clinical oral surgery requires knowledge of the basic medical sciences related to the specialty. Therefore, in addition to hospital and clinical training, the resident takes advanced coursework in such subjects as applied pharmacology, surgical anatomy, pathology, physiology and microbiology, and reviews such closely-related disciplines as roentgenology, anesthesiology, physical diagnosis and laboratory procedures.

The assumption of increased responsibility and the opportunity for clinical and operating room experience are important aspects of residency training.

The resident gains clinical training in anesthesiology through an assigned rotation in the Department of Anesthesiology. Previous advanced training in physical diagnosis, physiology, pharmacology and pathology now assume greater clinical significance. Increased responsibility in the operating room as first assistant and surgeon further develops surgical judgment and skills.

The development and implementation of a research project under staff supervision enhances the value of the residency training.

The senior resident may be given responsibility for major oral surgical cases during rotations in the University and VA hospitals. Each third-year resident is assigned on a rotational basis as a clinical and didactic coordinator and assumes responsibility to qualify for examination by the American Board of Oral Surgeons.

Admission

The deadline for graduate application in oral surgery is November 1 for admission July 1 of the next year.

Admission is limited to July 1 of each year for a full three-year program.

GRE Aptitude Test is required.

The applicant must be a graduate of an accredited college of dentistry and be licensed to practice dentistry in the United States.

The applicant should be in the upper one-third of his or her graduating class.

Information required includes application for graduate oral surgery, applicant appraisal form from applicant's references, transcripts, and letters of recommendation from the dean of the dental college from which the applicant graduated, and from two professional references.

Interviews are not required but are strongly recommended.

Applicants may be appointed any time after the application has been completed and the staff elects to take official action. All appointments should be extended on or before January 1 prior to the July 1 effective date.

The graduate admission office will send an admission form to the applicant to be completed for the Graduate College by approximately March 1.

Facilities

The University Health Center has outstanding basic and clinical science departments which stimulate and support scholarly research and superior clinical practice. The facilities of the University Hospitals, the Iowa City Veterans Administration Hospital and the colleges of Dentistry and Medicine provide an appropriate environment for residency training in oral surgery.

Hospital Organizations

The organizational structure at University Hospitals includes a clinical Department of Dentistry with Divisions of Oral Surgery, General Dentistry and Pedodontics. Under these auspices, the above-mentioned Oral Surgery residency program and a one-year general practice residency are conducted.

Predoctoral Courses

87:81 Anesthesia, Analgesia 1 s.h.
Principles and techniques in use of local anesthesia; practical application of local anesthesia techniques.

87:115 Anesthesia and Pain Control I 1 s.h.
Principles and techniques of complete medical history, head and neck examination, cardiovascular and respiratory examination; neuroanatomical and psychophysiological aspects of pain; pharmacologic action of local anesthetics and techniques in the use of local anesthetics.

87:130 Basic Oral Surgery 2 s.h.
Basic principles of oral surgery; indications and contraindications for extractions; evaluation of details of patient's related medical history; techniques of extraction and minor oral surgery procedures.

87:145 Anesthesia and Pain Control II 1 s.h.
Theory and application of nitrous oxide sedation; emphasis on cardiovascular and respiratory physiology; instrumentation of nitrous oxide sedation; evaluation of patients for nitrous oxide sedation, practical techniques of nitrous oxide sedation.

87:155 Advanced Oral Surgery 1 s.h.
History, examination, diagnosis and treatment of diseases and traumatic injuries of the oral cavity.

87:160 Clinical Oral Surgery I 4 s.h.
Clinical experience in oral surgery clinic.

87:185 Introduction to Hospital Procedure arr.
Orientation and exposure to the hospital environment in the Division of General Dentistry at University Hospitals; treatment of dental patients in hospital setting.

Graduate Courses

87:201 Hospital Procedures 1 s.h.
Hospital rules and regulations, patient and department records, general information relative to hospitalized patients.

87:202 Basic Science Review 4 s.h.
Includes head and neck anatomy with dissection, bacteriology, pathology, etc.; special lectures by medical and dental staff.

87:207 Surgical Anatomy 1 s.h.
Study of head and neck structures found in major oral

surgery procedures; special emphasis on maxillofacial problems and surgical emergencies; may include animal surgery.

87:208 Pain and Anxiety Control 3 s.h.
Concepts of nitrous oxide, intravenous, oral and intramuscular anxiety and pain control; pharmacology of various agents used; complications and their management.

87:209 Principles of Anesthesia 2 s.h.
Review of literature on general anesthesia with study of agents and their effects on respiratory and cardiovascular systems.

87:211 Literature Seminars and Journal Club 1 s.h.
Special attention to material covered in assigned journals.

87:212 Surgical Case Reports 1 s.h.

87:214 Roentgen Interpretation 2 s.h.
Review of theory and technique together with laboratory assignments.

87:215 Physical Diagnosis 2 s.h.
Review of principles of physical diagnosis.

87:218 Oral Pathology Conference 1 s.h.
Review and discussion of current clinical specimens.

87:225 Advanced Oral Surgery Seminar I 1 s.h.
Assigned readings.

87:226 Advanced Oral Surgery Seminar II 1 s.h.
Assigned readings.

87:227 Advanced Oral Surgery Seminar III 1 s.h.
Assigned readings; topics selected by students and faculty.

87:230 Oral Surgery Research I 2 s.h.
Topic selection, review committee selection, literature review.

87:231 Oral Surgery Research II 3 s.h.
Complete protocol and begin research program.

87:232 Oral Surgery Research III 3 s.h.
Thesis project. Complete research project and data gathering.

87:233 Oral Surgery Research IV and Thesis 3 s.h.
Thesis and defense. Comprehensive examination over three-year program.

87:240 Clinical Oral Surgery I arr.
Specialty and technical seminars and patient treatment. Clinical practice on assigned patient problems.

87:241 Clinical Oral Surgery II arr.
Specialty and technical seminars and patient treatment. Clinical practice on assigned patient problems.

87:251 Occlusal Analysis 1 s.h.
Relationships between occlusal dysharmonies and TMJ dysfunction syndrome; diagnosis and treatment of occlusal discrepancies.

87:253 Pre-Radiation Patient Treatment 1 s.h.
Planning dental treatment for the pre-radiation patient; review of literature.

87:255 Clinical Dentistry arr.
Specialty and technical seminars and patient treatment.

Orthodontics

Department head: John S. Casko
Faculty: *professors* George F. Andreasen, Samir E. Bishara, Richard M. Jacobs, Charles R. Kremenak
associate professor Robert N. Staley
Degree offered: M.S.

Predoctoral Program

The purpose of the predoctoral program in orthodontics is to enable the general practitioner of dentistry to recognize, diagnose and treat with competence simple malocclusions of the teeth.

Lecture courses guide the student in the learning of basic concepts of dental and facial growth, as well as treatment-oriented subject matter. In a laboratory course, diagnostic records are taken and evaluated and treatment appliances are fabricated. A volunteer program of clinical treatment of selected patients is supervised by the Department.

Opportunities exist for research and independent study in the Department.

Graduate Program

The purpose of the graduate program in Orthodontics is to educate specialists capable of diagnosing and treating any malocclusion of the teeth requiring comprehensive care. The specialist should be familiar with and able to critically analyze biologic, biomechanic, diagnostic and treatment concepts in orthodontics.

Satisfactory completion of a 23-month period of intensive study, including lecture courses, seminars, clinical practicum and a research paper, qualifies a student for the Certificate of Orthodontics. If a student satisfactorily completes a thesis based on an original research project, he or she will qualify for an M.S. degree in addition to the Certificate of Orthodontics.

Opportunities are available for research and independent study in the Department.

Admission requires the D.D.S. degree, or its equivalent, and satisfaction of Graduate College requirements.

Special facilities for research in biomechanics and craniofacial growth are available. Interaction with other departments provides learning and research opportunities in surgical orthodontics, cleft lip and palate treatment, speech pathology, animal experimentation and human growth.

Admission

The application deadline is October 1, for the class starting July 1. Applicants will be required to come to the University for interviews with the faculty of the Department.

Courses

89:115 Growth and Development 1 s.h.

89:130 Orthodontic Diagnosis and Its Biological Foundations 1 s.h.
Introduction to various concepts of craniofacial biology basic to orthodontics diagnosis, and the philosophy of management of orthodontic problems; topics include development of dentition, physiology of stomatognathic system, neurophysiological considerations, growth and development, genetic variability in the face and teeth, growth of the cranium and facial skeleton.

89:135 Orthodontic Laboratory 1 s.h.
Practical experience in taking and analyzing orthodontic diagnostic records, developing treatment, planning, constructing appliances.

89:136 Orthodontic Treatment 1 s.h.
Ranges from patient management to the use of different appliances to correct some of the malocclusions the general practitioner can handle in his office.

89:145 Delivery of Orthodontic Services by the General Practitioner 1 s.h.
Assigned slide script series covers instrumentation, expendable and nonexpendable supplies and equipment needed in the general practitioner's office; treatment cases illustrating types of malocclusions which should be treated in the orthodontic office, longitudinal cases of adult orthodontics needing attention before other aspects of dentistry can be completed (e.g., crown and bridge), from diagnosis through follow-up records of from three to seven years; removable vs. fixed appliances; elementary survey and comparison of adverse side effects inherent in orthodontics; adverse tooth movement caused by indeterminate reactions or partially determinate reactions in other segments of the mouth; importance and variation of retention for a stable result; problems in educating predoctoral student for effective clinical care of a patient.

89:170 Orthodontic Clinic arr.
Clinical experience in orthodontic diagnosis, treatment planning, and treatment; selected patients with malocclusions appropriate for undergraduate treatment; record-taking; diagnosis and treatment carried out under guidance of orthodontic graduate student and staff member; may be started during latter part of second year; student must follow patient from initial records to completion of treatment; student must honor all obligations to patient, which may include appointments during summer months.

89:171 Advanced Orthodontic Concepts arr.
Provides exposure of interested students to advanced coursework in Department's graduate program. Prerequisite: instructor's permission.

89:172 Special Orthodontic Projects arr.
Undergraduate research project designed to give student an opportunity to learn scientific methodology in investigation of a particular orthodontic problem. By special arrangement with faculty.

For Graduate Students

89:200 Control Theory and Craniofacial Morphogenetic Systems 2-3 s.h.
To broaden students' general biological perspective, acquaint them with what is now variously called general system theory, control theory, cybernetics, systems analysis; develop sense of perspective about role of applied human biologist; provide information about the status of human biology as a science.

89:201 Orthodontic Theory: Diagnosis and Treatment Planning 2 s.h.
Seminar readings pertaining to art and science of orthodontic diagnosis.

89:202 Diagnosis and Treatment Planning 2 s.h.
Seminar readings concerning orthodontic diagnosis; treatment of particular kinds of orthodontic problems; students present case histories of patients treated in graduate clinic.

89:203 Advanced Orthodontic Technique arr.
Weaves theoretical ideas into manual skills student must reproduce on typodont to have immediate recall of statistically indeterminate problems practitioner encounters every day; not a technique course per se, but includes complete spectrum of principles underlying all techniques developed since 1900, in context of modern materials.

89:204 Biomechanics arr.

89:205 Facial Growth 1-2 s.h.
Different theories and processes related to the growth of the face.

89:206 Facial and Dental Growth 2 s.h.
Utilization of accepted concepts of facial growth in the treatment of individuals with various types of malocclusions during their active growth period.

89:207 Case Analysis arr.
Seminar readings in diagnosis and treatment of mixed dentition patients; students present case histories of patients treated by serial extraction procedure.

89:209 Orthodontic Practicum arr.
Clinical practice at the chair.

89:210 Orthodontic Seminar arr.
Evaluation, discussion, criticism, defense of different diagnostic and treatment approaches to orthodontic cases which need, are undergoing, or have completed orthodontic treatment.

89:211 Problems: Orthodontics arr.

89:212 Research: Orthodontics arr.

89:214 Research: Methodology arr.
Topics include formulation of problem; methodology and literature review; research design methods of data collection; interpretation of quantitative data; methods of graphics photography, and graphical math used to generalize the findings; role of discussion, summary and conclusion.

89:215 Orthodontic Journal Club arr.
Reading of current biological and technical publications; students critically evaluate articles, are encouraged to think critically about new knowledge and to accept or reject concepts by debating their points before the class.

89:216 Practice Management arr.
Business management of orthodontic practice; topics range from solo practice to associateship, partnership, practice corporation.

89:217 Cephalometrics arr.
Evaluation of skull X ray (lateral and/or postero-anterior) as one of many adjuncts student will use in formulation of orthodontic diagnosis and treatment plan for individuals with malocclusions; additionally, cephalometrics as a tool for research on craniofacial structures.

89:220 Craniofacial Anatomy arr.
Readings concerning anatomy, phylogeny, ontogenesis, and physiology of craniofacial structures of interest to orthodontists; seminar format.

Pedodontics

Department head: Stephen H.Y. Wei
Faculty: *professors* Clemens A. Full, Ulf L. Karlsson, Arthur J. Nowak, Frederick M. Parkins, Leon M. Silverstone, Stephen H.Y. Wei
associate professors Jimmy R. Pinkham, Jerry D. Walker
assistant professor Brian H. Clarkson
adjunct assistant professor James S. Wefel
instructor Mary H. Waziri
Degree offered: M.S. (certificate also offered)

The Department of Pedodontics provides instruction for dental and graduate students in the prevention and treatment of dental diseases in children. Instruction combines didactic, laboratory, and clinical experiences. It gives special consideration to reviewing current literature and managing dental problems of handicapped children, and emphasizes efficient treatment through proper utilization of dental auxiliary personnel and record management.

The Graduate Program

Graduate study in Pedodontics leads either to certification or a master's degree. The program gives special emphasis to preparation for certification by the American Board of Pedodontics. It is fully accredited by the Council on Dental Education.

Students are trained in all phases of pedodontics, to permit them career choices in practice, education, or research.

Approximately 40 percent of the program is devoted to advanced clinical activity, 40 percent to didactic courses and practice teaching, and 20 percent to original research.

The program comprises a core of clinical and basic science courses, supplemented by elective selections determined by the student's individual interests.

Development of a minor subject area is recommended.

Dual degree programs have been arranged with several other departments. Close association with the Department of Pediatrics in the College of Medicine, and with the University Hospital School and University Hospitals, permits emphasis on oral rehabilitation under general anesthesia, instruction in physical diagnosis, and management of exceptional children.

Research Opportunities

Research carried out by graduate students in Pedodontics has been selected on a number of occasions for national awards and journal publications.

Clinical and laboratory research projects are in progress, with financial support from federal agencies and other sources. Significant contributions have been made in the areas of fluoride action and child behavior management.

Quality of Faculty

Faculty members hold numerous national and state offices, committee memberships, consultantships, and honors in professional organizations. They serve as reviewers for several professional journals and federal granting agencies. They also participate regularly in continuing education programs for dentists and other health science personnel. Several members are Diplomates of the American Board of Pedodontics.

Financial Aid

Stipend support is available to qualified students.

Admission

Apply to the Graduate College.

Courses

90:140 Pedodontic Diagnosis and Treatment 2 s.h.
Concepts of growth and development, behavior management, and preventive-restorative techniques for pediatric patient.

90:160 Clinical Pedodontics 4 s.h.
Comprehensive clinical management of pediatric patient.

Primarily for Graduates

90:210 Introduction to Advanced Clinical Pedodontics 2 s.h.
For first-year graduate students; emphasis on growth and development, child management, and therapy.

90:220 Advanced Electron Optical Research Technique arr.
Same as 60:220, 61:220, 2:220.

90:225 Pedodontic Literature Review I 1 s.h.
Discussions of growth and development, behavior management, preventive-restorative techniques, and diseases of pediatric patient.

90:226 Pedodontic Literature Review II 1 s.h.
Discussions of preventive orthodontics, fluoride therapy, health and nutrition guidance, anesthesia, pharmacology, and minor oral surgery as related to pediatric patient.

90:227 Pedodontic Literature Review III 1 s.h.
Discussion of behavior management, preventive-restorative techniques, multidisciplinary care for the handicapped child.

90:228 Pedodontic Literature Review IV 1 s.h.
Discussion of community responsibilities and practice management, hospital affiliations, and advanced pharmacology for pedodontist.

90:229 Dental Management of the Handicapped Child arr.
Principles and techniques for managing various handicapping conditions of children in the dental office.

90:230 Research in Pedodontics arr.

90:231 Thesis Preparation 3 s.h.
Preparation of original research project and completion of thesis.

90:240 Advanced Clinical Pedodontics arr.
Comprehensive clinical management of pediatric patient in areas of preventive orthodontics, operative therapy, endodontia, and minor oral surgery.

90:241 Pediatric Physical Diagnosis for Dental Practice 1 s.h.
Principles and rationale for making a physical evaluation of the child.

90:242 Pediatric Therapy for Dental Practitioners 1 s.h.
Principles of therapy in various disease conditions.

90:243 Pedodontic Hospital Rehabilitation arr.
Comprehensive dental treatment under general anesthesia.

90:244 Pediatric Rounds arr.
Pediatric diseases and their hospital management.

90:250 Practice Teaching in Pedodontics arr.
Observations and practice in current teaching procedures.

90:260 Fluoride and Dental Health 2 s.h.
Comprehensive lecture-seminar update on clinical uses of fluoride in dentistry; discusses history and systemic and dental benefits of water fluoridation, medical, legal aspects; covers fluoride in food and its metabolic fate in the body; clinical applications include prescription of fluoride supplements, rational use of topical fluoride and prophylaxis pastes, fluoride dentifrices and rinses; research data on developments of new fluoride agents.

90:261 Advances in Pedodontics 1 s.h.
Lecture course presented by Pedodontic faculty in areas of their expertise, represents most recent advances in clinical pedodontics as well as research related to pedodontics; covers advances in caries research, oral diagnosis, restorative procedures; current concepts in sedation, periodontal evaluation, and treatment in children and adolescents; concepts of diagnosis and treatment of pulp therapy and patient management techniques, advances in preventive dentistry.

Periodontics

Department head: Phillip A. Lainson
Faculty: *professors* C. Mahlon Fraleigh, Phillip A. Lainson, Ian C. Mackenzie, Charles B. Sabiston, Jr.
associate professors William R. Grigsby, William C. Rubright
assistant professors Paul J. Collins, Ali Farnoush, Paul L. Glick, Ronald Peterson
Degree offered: M.S., interdisciplinary Ph.D. (certificate also offered)

Predoctoral Program

The Department of Periodontics is concerned with the diagnosis, prevention and treatment of periodontal disease. Its predoctoral program combines didactic, laboratory and clinical experience, with emphasis on applying the biological concepts of periodontology to the comprehensive clinical management of patients who have periodontal disease.

Master of Science Program

The Master of Science program is designed primarily to provide training for teaching, research and specialization in periodontics. In compliance with the regulations of the Graduate College and to meet all the requirements of the American Board of Periodontology for eligibility for certification, the program requires:

Satisfactory completion of a minimum of 60 semester hours of the required and elective courses;

Preparation and defense of an acceptable thesis based on original research requiring 11 semester hours of research and three semester hours of thesis preparation; and

Satisfactory completion of a comprehensive written and oral examination.

Completion of the program requires 27-36 calendar months of full-time study.

Interdisciplinary Ph.D. - Periodontal Research Program

The purpose of the program is to train dentists for an academic career in research and teaching in the field of periodontal disease. The main thrust of the program is in the accomplishment of periodontally related research, with the necessary didactic and practical scientific training in the basic sciences. The program will be tailored to the prior background and interests of each trainee with direct research supervision supplied by a member of the faculty, whose own research activities and interests lie in the trainee's area of research.

Applicants to the program will be selected from individuals with a D.D.S. (or equivalent) degree, with strong preference given to applicants who also hold an M.S. degree. Applicants will be enrolled in an interdisciplinary program leading to a Ph.D. degree in either periodontics (anatomy), periodontics (biochemistry), periodontics (microbiology), periodontics (pharmacology) or periodontics (physiology). The certification program in periodontics may also be combined with this program.

Certification Program

Designed to meet all the requirements of the American Board of Periodontology for eligibility for certification, the certification program provides a sound foundation for the clinical practice of periodontics.

Completion of the program will require 24 calendar months of full-time study, and will require:

Satisfactory completion of a minimum of 60 semester hours of the required and elective courses;
Satisfactory completion of a comprehensive written and oral examination; and
An acceptable literature review paper.

Opportunities are provided for experience in clinical and basic research.

Facilities

The Department has 20 modern and well-equipped operatories devoted exclusively to periodontics, and access to hospital experience in adjacent University and V.A. hospitals. Research facilities include a departmental research laboratory, and collegiate laboratories in histology and histochemistry, microbiology and biochemistry, electron microscopy with EM and scan capabilities, and growth and development. These collegiate facilities are in addition to those available by arrangement in the University and V.A. hospitals and the basic science departments.

Financial Aid

The applicant must be financially prepared to undertake uninterrupted studies. Assistantships are offered dependent upon available resources. The Interdisciplinary Ph.D.-Periodontal Research Program is supported by a full research stipend.

Admission

Admission requires the D.D.S. degree or its equivalent, and satisfaction of Graduate

College requirements. Interviews are encouraged but not mandatory.

Predoctoral Courses

92:61 Introduction to Periodontology 2 s.h.

92:140 Periodontic Methods 2 s.h.
Fundamental concepts of periodontology, presented in a lecture and seminar format augmented by slide-tape series.

92:160 Periodontics 3 s.h.
Comprehensive clinical management of the periodontal patient.

92:165 Periodontology 1-2 s.h.
Comprehensive concepts of periodontology and the clinical management of patients are presented by lecture and seminar topic.

Graduate Courses

92:201 Advanced Periodontology arr.
Provides incoming graduate student with comprehensive review of periodontal therapy.

92:202 Clinical Seminar in Periodontics arr.
Comprehensive management of periodontal patient, presented with emphasis on treatment planning and case documentation and presentation for complete dental therapy. Conjoint dental science seminars included. Required each fall and spring semester.

92:205 Methods of Instruction in Periodontics arr.
Experience in course design in periodontics, including behavioral objectives and methods of evaluation.

92:207 Practice Teaching in Periodontics arr.
Practical experience in lecturing, seminar direction and clinical teaching in periodontics.

92:208 Recent Advances in Periodontics arr.

92:210 Periodontology Pathology Seminar arr.
Emphasizes differential diagnosis and histopathology of oral lesions often encountered in clinical periodontal practice.

92:212 Applied Oral Microbiology arr.
Review and extension of student's knowledge of microbiology as it applies to oral health problems.

92:213 Biochemical Aspects of Periodontology arr.
Emphasizes biochemical subjects (blood clotting, cell metabolism, nutrition, etc.) relevant to periodontology.

92:214 Periodontics-Orthodontics arr.
Condensed view of orthodontic diagnosis and biomechanical principles used to move teeth in periodontal patients.

92:216 Dental Sciences Research Methodology arr.
Provides familiarity with practical procedures involved in general and specific methods for preparation and examination of biological specimens related to dental research.

92:217 Dynamics of Oral Soft Tissues arr.
Review of methods and literature associated with changes in cell kinetics of periodontal soft tissues.

92:218 Methods for Advanced Studies of Oral Tissues 2 s.h.
An examination of advanced research techniques which have led to the present concepts of structure of selected dental tissues and materials.

92:225 Periodontology Literature Review I 1 s.h.

92:226 Periodontology Literature Review II 1 s.h.

92:227 Periodontology Literature Review III 1 s.h.

92:228 Periodontology Literature Review IV 1 s.h.

92:230 Research Periodontology arr.

92:231 Thesis Preparation in Periodontology 3 s.h.
Preparation of original research project and completion of thesis.

92:240 Advanced Clinical Periodontics arr.
Comprehensive clinical management of the periodontal patient with emphasis on the complex case.

Preventive and Community Dentistry

Division head: W. Philip Phair
Faculty: *professor* W. Philip Phair
associate professors James D. Beck, Howard M. Field, Nelson S. Logan
assistant professors Robert E. Glenn, Paul E. Kerber, Derek H. Willard
instructor Quinton Hedgepeth
Degree offered: M.S. in Community Dentistry

Programs in preventive and community dentistry are designed to provide dental students with experiences to increase their awareness of unmet health needs and to encourage students to develop and implement approaches to alleviate these needs. Extramural programs provide students with opportunities to interact with health care teams and members of communities in Iowa. The department conducts five full-time offsite extramural programs throughout the state.

Using the community as the classroom, students are able to observe and participate in a variety of activities intended to make the student aware of the societal obligations he or she must assume in order to practice effectively.

Included in the Department's resources are two mobile dental vans, one with five operatories and a second smaller unit designed for prevention programs. The vans are operated throughout Iowa, and give senior dental and dental hygiene students and graduate students an experience which closely simulates community dental practice.

Master of Science Program

The Master of Science degree program is designed to prepare students in community dentistry, with emphasis on research, teaching, or administration. The objective of the program is to help students achieve a high degree of professional competence in their respective areas of special interest. Successful graduates of this program will have met educational requirements necessary to establish their eligibility for the American Board of Dental Public Health.

The program requires a minimum of 42 semester hours of coursework. The full-time program requires a minimum of 18 months of coursework and practicums to meet the M.S. and residency requirements.

Predoctoral Courses

111:116 Preventive Dentistry I 2 s.h.
Introductory for first-year dental students; includes lectures, laboratory, small-group discussions, and clinical experiences; students identify health and disease in their own mouths and learn practical methods of control; their patients are classmates and evaluation is based on success in controlling their own oral disease.

111:117 Preventive Dentistry II 1 s.h.
Specific data describing dental plaque and two related disease processes: dental caries and periodontal disease; data given to support the use of fluorides, sealants, and plaque control mechanisms for the control and prevention of caries and periodontal disease.

111:118 Preventive Dentistry III 2 s.h.
Fundamental description of instrumentation for detection and removal of calculus presented with evaluation systems for use within a laboratory-clinical prophylaxis program; students participate in application of knowledge regarding the detection and removal of calculus, application of topical fluorides and occlusal sealants, plaque control mechanisms, and communication skills.

111:145 Preventive Dentistry IV 2 s.h.
Clinical program to allow the student to provide a complete prophylaxis-preventive service for collegiate patients; data given to support the use of communication skills and application of such skills in a clinic setting; specific data concerning human nutrition, with emphasis on evaluation and counseling.

111:158 Clinical Photography 1 s.h.
Seminar and laboratory sessions dealing with photography in general and specific concentration on intraoral photographic systems and their related problems.

111:160 Community Dentistry 2 s.h.
Introduction to community dentistry; includes study of a community's dental health; principles of epidemiology; community preventive programs; ethics and jurisprudence; financing dental care; dental health care issues at the local, state, and national levels, and the selection of a practice location.

111:185 Community Extramural Experience arr.
Broadlawns Hospital Externship (Family Practice Unit)
Students spend four weeks, in teams of four, providing dental health care to patients in a metropolitan hospital setting. Special emphasis here is placed on student participation in appropriate departments of the hospital, including the Family Practice Center and the Emergency Room Service.

Mental Health Externship
In teams of two or three, students spend a minimum of two weeks as externs at the Independence Mental Health Institute, with two or three hours per day in dental clinic, and the remainder (including evening ward rounds and internal seminars) in various units of hospital instruction; includes a general orientation in mental health, normal and abnormal human behavior and ways of working with and treating emotionally disturbed children and adults.

Mobile Unit Program
Two weeks with mobile units providing dental services for underprivileged people throughout Iowa under faculty supervision; important adjunct to clinical activity is community experience gained through participation in training and education programs in health departments, schools and community agencies.

Private Practice Preceptorship
During each of six time periods, approximately 30 students may elect to spend approximately six weeks of their regular academic year under the supervision of a dentist-preceptor practicing in Iowa; students are involved in various aspects of practice, office management and community affairs.

Geriatric Field Clinics Externship
Two to four weeks providing dental service with special emphasis on dental health care for the elderly patient; community service aspects of this experience include screening programs in nursing homes, county homes and other community agency sponsored locations.

Graduate Courses

111:200 Literature Review in Preventive and Community Dentistry 2 s.h.
Review of literature on assigned subjects under guidance of individual faculty members and through scheduled seminars at which reports are presented; written reports including a critical review of literature and annotated bibliography required in at least one subject area.

111:201 Practicum: Teaching Preventive and Community Dentistry 2 s.h.
Practical experience gained by preparing course objectives and evaluation procedures, presenting lectures, leading seminars and supervising field experiences for undergraduate students.

111:202 Research Seminar in Community Dentistry 2 s.h.

111:203 Independent Study in Preventive and Community Dentistry arr.
Individual study in area of special interest to student and approved by faculty supervisor; study design, procedures and results reported in paper.

111:204 Epidemiology of Dental Diseases 2 s.h.
Participants study ways disease patterns in population are affected by its way of life; comparisons made between people from differing ethnic and cultural groups and geographic areas as to prevalence of dental diseases and factors of health and disease identified; actual design, conduct and report of an epidemiological study may be undertaken as a practicum field project.

111:206 Problems in Preventive and Community Dentistry 2 s.h.
Problem presented in which literature has been reviewed, material collected, experiments or examinations conducted, data checked and conferences arranged with consultants on solution of problem; investigation reported in paper which may be published.

111:208 Field Experience in Community Dentistry arr.
Individual arrangements for directed field experience of varying length planned in cooperation with official and voluntary health agencies according to needs of students.

111:211 Thesis: Preventive and Community Dentistry arr.
Thesis research and writing in area of community or preventive dentistry.

111:212 Statistical Methods in the Biomedical Sciences 3 s.h.
Statistical methods and concepts particularly appropriate for biomedical research topics include descriptive methods, elementary probability, distributions, populations and samples, methods for analyzing percentage data and paired and unpaired measurement data, regression and correlation and analysis of variance.

111:224 Design & Evaluation of Research Dentistry 2 s.h.

Removable Prosthodontics

Department head: Forrest R. Scandrett
Faculty: *professors* Ralph C. Appleby, William E. LaVelle
associate professors Ronald L. Ettinger, Thaxter H. Miller, Forrest R. Scandrett
assistant professor Jay G. Hanson
instructor Lawrence R. Huber
adjunct assistant professors Robert A. Strug, John R. Thompson
adjunct instructors Paul K. Maxwell, Su Hsin Tung
Degree offered: M.S.

Removable prosthodontics is the specialty of dentistry involving complete dentures and removable partial dentures.

The predoctoral program provides the student with the basic principles, practices and concepts of removable prosthodontics required for the practice of general dentistry, through laboratory projects and treatment of patients with differing prosthodontic needs.

The Master of Science degree program prepares the specialist for a career in education and research. It also satisfies the formal training requirements for eligibility for the American Board of Prosthodontics examination.

The requirements are flexible, permitting the development of a plan of study which will fill the individual needs of each student. This is possible since normally not more than two students are accepted each year for advanced training in the Department. Each student is required to prepare a thesis based on original research and pass an oral and/or written comprehensive examination. The student's adviser will serve as chairman of the examining committee. The student will be required to meet all the requirements for the master's degree as outlined in the *Manual of Rules and Regulations of the Graduate College.*

Minimum requirements for admission to the program correspond to the minimum requirements for admission to the Graduate College. In addition, the student must hold a D.D.S. or D.M.D. degree or its foreign equivalent. No advanced GRE is required.

Courses

84:120 Prosthodontic Materials Laboratory 1 s.h.
Theory and manipulation of dental materials with basic applications. Same as 81:120.

84:140 Removable Prosthodontic Technique Lecture 3 s.h.
Technical procedures in construction of complete and removable partial dentures.

84:141 Removable Prosthodontic Technique Laboratory 3 s.h.
Laboratory exercises in construction of complete and removable partial dentures.

84:160 Removable Prosthodontics 4 s.h.
Seminar and clinical experiences: mouth examination, diagnosis, prognosis and treatment of patients requiring complete and removable partial dentures.

84:225 Complete Denture Seminar I 1 s.h.
Review of current research in principles, practices and concepts of complete denture construction.

84:226 Removable Partial Denture Seminar I 1 s.h.
Review of current research in principles, practices and concepts of removable partial denture construction.

84:227 Complete Denture Seminar II 1 s.h.
Review of past research in principles, practices and concepts of complete denture construction.

84:228 Removable Partial Denture Seminar II 1 s.h.
Review of past research in principles, practices and concepts of removable partial denture construction.

84:230 Research: Removable Prosthodontics arr.
Literature review, protocol preparation and data collection for selected research project.

84:231 Thesis Preparation: Removable Prosthodontics arr.
Preparation and defense of thesis from research project.

84:240 Advanced Clinical Removable Prosthodontics arr.
Treatment of patients requiring complete and removable partial dentures.

84:241 Technique Methods: Removable Prosthodontics arr.
Assigned problems involving technical methods in construction of complete and removable partial dentures.

84:242 Practice Teaching: Removable Prosthodontics arr.
Clinical and classroom teaching experience assigned by adviser.

84:250 Journal Club 1 s.h.
Review of current literature in prosthodontics.

84:251 Library Assignment Removable Prosthodontics arr.
Discussion of assigned readings that are considered classics in removable prosthodontic literature.

College of Education

Dean: Howard R. Jones
Associate deans emeriti: Henry D. Dekock, Lauren A. Van Dyke
Assistant deans: Stuart C. Gray, Alan B. Henkin, William A. Matthes, Owen L. Springer
Director, Iowa Testing Programs: William E. Coffman
Director, Educational Placement: Judith D. Hendershot
Degrees offered: B.A., B.S., M.A., M.A.T., Ed.S., Ph.D.

The first permanent college-level department of education in the United States was established at The University of Iowa in 1872. The department became the School of Education in 1907 and the College of Education, structured in the basic pattern which governs it today, was founded in 1913. The growth of the College has corresponded to the growth of the University.

The College has eight divisions: Post-Secondary and Continuing Education; Educational Administration; Early Childhood and Elementary Education; Educational Psychology, Measurement and Statistics; Secondary Education; Counselor Education; Special Education; and Instructional Design and Technology.

The University is accredited by the National Council for Accreditation of Teacher Education (NCATE) for the preparation of elementary and secondary teachers and other professional school personnel, with the doctorate the highest degree approved. Teacher preparation programs are also reviewed and approved by the Iowa Department of Public Instruction.

Teacher Education Programs

The College of Education offers undergraduate programs in teacher education leading to certification in early childhood and elementary teaching, secondary school teaching, teaching in special education for mentally retarded and physically handicapped children, and health occupations education.

Admissions

Students who are interested in becoming teachers should indicate their proposed teaching major on the Application for Admission to The University of Iowa. Students who decide at a later date to enter the Teacher Education Program (T.E.P.) must declare the appropriate teaching major as their major in the College of Liberal Arts Advisory Office, 116 Schaeffer Hall, and submit an Application for Admission to the Teacher Education Program to the Office of Admissions, 107 Calvin Hall by May 15th preceding the academic year in which the applicant plans to enroll in professional education courses. Applications received after that date will be approved only if faculty and practicum resources permit.

General Information

Students admitted to the T.E.P. are degree candidates in the College of Liberal Arts or College of Business Administration and must complete the requirements for the Bachelor of Arts, Bachelor of Science, or Bachelor of General Studies degrees as explained in those colleges' sections of the University *Catalog*. Policies, rules, and regulations of these colleges apply to students in the T.E.P. Students seeking the B.G.S. degree should especially note that a maximum of 40 semester hours of credit earned in the College of Education may be applied toward the degree.

Grade-Point Average

Although freshmen are admitted to the T.E.P., students are not eligible to enroll in professional education courses before they have completed 28 semester hours. The academic records of all students admitted to the T.E.P. will be reviewed at the end of each semester and students who have not maintained a 2.20 G.P.A. on all coursework attempted and on all University of Iowa coursework will be dropped from the T.E.P. Students who are dropped from the T.E.P. may reapply and may be readmitted when the required 2.20 G.P.A. is achieved, if enrollment limits have not been reached.

Limitations on Enrollments

Because of the limits of faculty and teaching stations, it may be necessary to restrict enrollments in early childhood education, elementary education, and special education, and in social studies and English in secondary education. In the event that the number of T.E.P. applicants exceeds the capacity of a program, students will be selected by rank order on the criteria established by the faculty.

Admission Requirements

To be admitted to foundation courses in education, an undergraduate student must:

Have been admitted to The University of Iowa as a degree candidate;
Have completed the American College Tests;
Be free of any health impairment or physical handicap which will preclude teaching success;
Have attained sophomore standing (28 semester hours) prior to the semester during which he or she seeks to enroll in the foundations of education sequence of courses;
Have achieved a 2.20 grade-point average on all college coursework attempted and coursework completed at The University of Iowa;
Have submitted an Application for Admission to the Teacher Education Program (see date above).

Graduate students must:

Have been admitted to the Graduate College;
Have a cumulative grade-point average of not less than 2.50 (2.70 for M.A.T.) on undergraduate coursework;
Have been admitted to a specific certification program (e.g., elementary education, special education or secondary English).

Student Teaching

The final phase of the Teacher Education Programs is the professional semester, devoted to supervised student teaching and directed observation in a variety of situations. Periodic seminars provide for discussion and evaluation of student teachers' experiences. The student teaching requirement may not be met by transfer credit except under unusual circumstances and with approval in advance.

To register for student teaching, the student must have:

Satisfactorily completed eight semester hours during one academic session in residence at The University of Iowa;
Satisfactorily completed 7P:75 Educational Psychology and Measurement, 7W:91 Audiovisual Equipment for Instruction (Elementary) and 7E:100 Introduction: Elementary and Early Childhood Teaching or 7S:100 Introduction: Secondary School Teaching and 7E:91 Pre-Education Practicum or 7S:91 Pre-Education Practicum;
Satisfactorily completed the appropriate methods courses;
Maintained a cumulative grade-point average of not less than 2.20 if an undergraduate student, 2.50 if a graduate student, 2.70 if an M.A.T. candidate on all college work attempted, all college work attempted at The University of Iowa and all work attempted in his or her teaching major;
Filed application for an assignment by March 15 preceding the academic year during which student teaching is desired.

Waivers

Students who have completed practicum-type experiences or courses which they feel should be considered in lieu of requirements should consult with their advisers concerning waiver procedures.

The CUTE Program

Students who feel they may better advance their educational interests through student teaching in an inner-city situtation, and who are interested in working with inner-city youth, may apply for the Cooperative Urban Teacher Education (CUTE) program through the Director of Student Teaching. Iowa is one of several midwestern institutions which place selected students in the Kansas City inner-city system. The program is open to any student who meets the requirements for student teaching.

Overseas Student Teaching

In cooperation with the University of Wisconsin-River Falls, a split student teaching assignment is available (eight weeks in one of our regular centers and eight weeks in either Australia, England, Republic of Ireland, Scotland, or Wales). Students must make their own travel arrangements, housing will be located for the students by the on-site coordinator. Students electing this program must meet the regular requirements for student teaching.

State Requirements

Certification to teach in many states requires a course in U.S. history or in American government. An initial certificate may be obtained in Iowa without meeting this requirement. However, a certified teacher who has not previously met the requirement must complete a minimum of two semester hours of U.S. history or American government before a certificate can be renewed. Students are, therefore, encouraged to include such a course in their preservice programs. Any of the following courses will satisfy the requirement:

30:1 Introduction to American Politics (may also be used toward social science core requirement of the College of Liberal Arts)	4 s.h.
16:61 American History 1492-1877	3 s.h.
16:62 American History 1877-Present	3 s.h.
16:161 The Colonial Period in America	3 s.h.
16:162 American Revolution Period 1740-1789	3 s.h.
16:163 United States in the Early Republic	3 s.h.
16:164 Civil War and Reconstruction	3 s.h.
16:167 The Contemporary United States 1920-1940	3 s.h.
16:168 The Contemporary United States 1940-Present	3 s.h.

Advanced Studies

Graduate study in the College of Education is guided by the general regulations of the Graduate College, with certain additional requirements imposed by the faculty of the College of Education. Graduate students in education register in the Graduate College and receive their degrees from that college.

The College of Education offers these advanced degree programs:

Master of Arts

The Master of Arts program is offered on both a thesis and non-thesis basis. The non-thesis M.A. program usually provides more specialized coursework than is found in the M.A. thesis program. The non-thesis program is not necessarily a terminal program, but students who expect to continue their studies on a doctoral program are urged to select the M.A. thesis program which offers more experience in research procedures. Students who complete a non-thesis M.A. program and are admitted to a Ph.D. program may be asked to submit evidence of writing and research skills to their adviser or division during the early part of their doctoral program.

Master of Science

Thesis and non-thesis programs are available for students desiring a concentration in science. The degree outlines and the use of the programs are similar to those above for the Master of Arts degrees.

Master of Arts in Teaching

The M.A.T. program is a 38-semester hour (minimum) non-thesis program designed for academically superior liberal arts graduates who included few or no professional education courses in their undergraduate programs. The program leads to a master's degree and certification as a secondary teacher in such fields as art, business, English, foreign languages, home economics, mathematics, science, and speech and drama. A gradepoint of at least 2.70 on undergraduate coursework is required for admission. At least 18 semester hours of graduate coursework in the student's proposed teaching field must be completed. A sufficient number of semester hours of graduate work in education (not less than 20) must be taken to satisfy certification requirements.

Specialist in Education

This degree is granted upon the completion of a prescribed two-year, post-baccalaureate program designed for students preparing themselves professionally in such fields as teaching, administration and supervision and special services. Of the minimum of 60 semester hours required for the degree, 28 are prescribed in the area of specialization; the remaining credit may be earned in cognate fields, supervised experience, research and elective courses. The research must culminate in a written report. Other requirements and regulations applicable to the Ed.S. are the same as for the master's degree except that 15 semester hours of resident work on campus are required in one 12-month period or in two summer sessions and coursework completed ten years prior to the final examination must be evaluated to determine the amount of credit that may be accepted toward fulfillment of the program requirements.

Doctor of Philosophy

The Ph.D. is the highest academic degree and is conferred upon those students who have demonstrated superior scholarship and mastery of research skills in coursework as well as in the preparation and defense of a dissertation.

Professional Improvement

Students may be admitted to a professional improvement program for purposes of taking limited coursework rather than a degree program. This program provides for minimal advisement and is appropriate for persons seeking salary credits, who are undecided about career plans, or whose applications are too late to permit processing for regular admission into degree programs. Faculty review committees may admit students to this program rather than as degree candidates due to incomplete information, unclear degree objectives and the like, in order to permit registration in the University.

Certification Only

Students who have not been certified as teachers and who do not wish to pursue the M.A.T. or do not meet its admissions requirements may be admitted under the classification, "Certification Only." With students in this program, the adviser plans the academic major and educational sequence aspects of the program to meet the requirements for certification. Since enrollment in early childhood education, elementary education, special education and social studies and English in the secondary program is limited, admission of graduate students to this program is as carefully reviewed as for degree programs. Persons who wish to meet certification requirements for positions other than as a teacher (i.e., counselor, administrator or curriculum specialist) and who meet basic requirements and need only a few courses to validate or update their certification should apply for professional improvement status. Admission to a certification only program requires a minimum undergraduate grade-point average of 2.50.

Bulletin

Prospective graduate students should write to the College of Education for its bulletin, *Advanced Studies in Education*, which provides specific information about the various programs, admission procedures and requirements, and rules and regulations.

Support Units and Special Resources

The Center for Educational Experimentation, Development, and Evaluation develops proposals, conducts studies, publishes reports and monographs, and provides pre- and post-doctoral training. Its program relates to instructional technology, materials and systems design and development, research, demonstration, and dissemination of research and curricular products. It works in collaboration with federal, state and private agencies, colleges and cooperating school districts to design and conduct cooperative research, development, and evaluative projects.

The Computer-Based Education Lab offers hardware and consulting support for computer applications and instructional development related to ongoing instruction of the College of Education.

The Curriculum Laboratory provides materials primarily for students and faculty members interested in curriculum problems. It brings into a convenient central location approximately 20,000 elementary and secondary textbooks, reference books, courses of study, bibliographies, pamphlets and non-print media such as filmstrips, games, records, etc. The Laboratory also houses a 17,000-volume youth collection.

The Early Childhood Education Center provides practicum, curriculum development and research opportunities for undergraduate and graduate students preparing to work with prekindergarten children. The Center enrolls some 84 children ages two months to five years. Both full-day and half-day programs are provided.

The Educational Media Laboratory houses a variety of instructional equipment and materials. Its facilities provide opportunities to develop skills in design and production of instructional materials and in the operation of instructional equipment of all types. In addition, Laboratory staff members provide service to students and faculty of the College of Education for production of videotapes, color slides, filmstrips, super 8 films, thermofax, transparencies and other materials related to instructional development.

The Educational Placement Office serves undergraduate teacher education students interested in teaching positions as well as graduate students seeking other certified school positions. Graduate students interested in college teaching positions in

education or in other fields as well as those interested in administration or positions in higher education are also served by this office.

The Education-Psychology Library has approximately 109,360 volumes. It provides books, periodicals, reference books, films, ERIC microfiche, tests and a reserved book room for students and faculty.

Instructional Activities for the Classroom Teacher is a cooperative program between The University of Iowa and the State Department of Public Instruction involving the whole state of Iowa. The purpose is to conduct an in-service program for all classroom teachers of the handicapped.

The Iowa Testing Programs staff develops standardized educational tests, such as the widely-used Iowa Tests of Basic Skills and Iowa Tests of Educational Development, for use in elementary and secondary schools. This department also conducts research studies in educational measurement and evaluation, publishes brochures, sponsors lectures and symposia, provides consulting services to school systems, and provides training experience for graduate students in measurement and statistics.

North Central Association (NCA) of Colleges and Schools is the largest and most active of six regional accrediting associations in the United States; Iowa is one of 19 NCA-member states. The NCA's primary purpose is to foster improvement in education at the elementary, secondary and collegiate levels by self-evaluation of educational programs, visitation by evaluation teams and adherence to policies and standards for continued membership. The University of Iowa houses and supports the office of the chair of the Iowa NCA State Committee.

The Reading Clinic makes possible investigation into the fundamental causes of reading deficiencies and experimentation with methods of overcoming these deficiencies. It provides opportunities for observation and practice in the diagnosis and teaching of severely retarded readers.

School Program for Emotionally Disturbed Children is located in the child psychiatry unit of the University's Psychiatric Hospital. Children attending this school are residential patients in the child psychiatry unit. The program is supported by the Psychiatric Hospital and directed by the College of Education. Opportunities are available for student teaching and practicum experience in school psychological services.

Statistical Laboratory contains a variety of calculating equipment. It provides experience in the application of such equipment to the analysis of statistical data, and it provides facilities for the analysis of research.

University Counseling Services are facilities available to students in counseling psychology for research and practicum purposes.

University Hospital School is a University-affiliated facility and, as such, it strives to provide a viable balance of direct services to developmentally disabled youngsters, interdisciplinary training activities for personnel and research projects into program development and effectiveness.

The Hospital School contains two unique but integrated service sections, a residential program for physically handicapped youngsters from throughout Iowa, and a day program for youngsters from surrounding school districts who are mentally retarded. Placement of children into the facility is worked out cooperatively with parents, appropriate area education agencies and local school programs.

In addition to providing direct services to developmentally disabled youngsters, the Hospital School has two other closely related functions—specialized training for workers and trainees in all areas concerned with handicapped children, and clinical research pertaining to causes and prevention of handicapping conditions.

The basic philosophy of the facility is to return children to their local community programs within the shortest possible time. This philosophy is reflected in the maintenance of cooperative ties with local community programs either through outreach activities for training, pre-placement and follow-up purposes, or through conferences held at the facility.

Teacher Certification Services

Though each state has its own teacher certification requirements, a majority of state certification agencies have entered into an agreement to issue certificates to applicants who have completed approved teacher education programs in institutions accredited by the National Council for Accreditation of Teacher Education. The University of Iowa teacher education programs have been approved by the Council. Students planning to major in special education are advised to be certain they will be eligible for certification if they plan to teach in a state other than Iowa.

Financial Aids

Employment in Research Facilities

The College of Education maintains experimental, research, and laboratory relationships with school systems and the University maintains schools for the physically handicapped, emotionally disturbed, and mentally retarded. Other facilities providing graduate experience in research and practice include the Reading Clinic; Statistical Laboratory; Center for Educational Experimentation, Development, and Evaluation; Iowa Testing Program; and the Early Childhood Education Center. The Curriculum Laboratory, Educational Media Laboratory, Computer-Based Education Laboratory, and the Education-Psychology Library provide faculty and students with opportunities for conducting research and developing new instructional techniques. Persons interested in employment opportunities in these areas should contact the director of each facility and indicate their interests, their academic and experience records, and their career or degree goals at The University of Iowa.

Graduate Assistantships

Individual academic programs provide opportunities for teaching, research, or service assistantships, as well as fellowship and related employment opportunities. Inquiries should be addressed to the chair of the division or to the director of the special program in an area in which the student believes he or she can provide service or achieve an outstanding academic record. If the student has applied for admission, his or her student file is available for review by those responsible for selecting the assistantship(s) for their programs. Appointments are normally, but not always, made from within the program area of the assistantship.

Special Research Assistantship Program

The Iowa Testing Programs and the Iowa Measurement Research Foundation provide sufficient funds to support a limited number of Special Research Assistantships in

Education. Students admitted to or pursuing any of the advanced degree programs offered by the College of Education are eligible to apply provided they are United States or Canadian citizens. The assistantships are for the academic year only, are renewable for a limited number of times, and, at the present, provide stipends similar to those for other assistanships. Holders are assigned to work under the direction of a faculty member in a research capacity and must carry a study or personal research load of not less than nine, or more than 12, semester hours per semester. The appointments are renewable. All candidates must submit transcripts of college work completed (undergraduate as well as graduate), letters of recommendation, and scores on the Graduate Record Examination Aptitude Test. The application must be filed on a special form which may be obtained from the director of the Iowa Testing Program, Lindquist Center for Measurement. The application deadline is February 1.

Loans and Outside Employment

Information about commercial and federal loans as well as part-time employment in the University and the community may be obtained from the Office of Student Financial Aids.

L. A. Van Dyke Student Loan Fund

This loan fund has been established by former advisees, colleagues and other friends of Associate Dean Emeritus L. A. Van Dyke in recognition of his significant contribution to education in the state and the nation and is available to degree candidates in secondary education with superior performance records as scholars and as teachers or administrators. For further information and application blanks contact Professor J.E. McAdam, Division of Secondary Education, W104 East Hall, The University of Iowa, Iowa City, Iowa 52242, or the Office of Student Financial Aids.

College of Education Graduate Awards

Awards are presented to outstanding graduate students in the College of Education at the spring semester faculty meeting of the College. These are:

Perry Eugene McClenahan Award: To the outstanding candidate for an advanced degree in educational administration.

Paul C. Packer Award: To the outstanding candidate for the master's degree in education.

Harvey H. Davis Award: To an outstanding student in educational administration or higher education, particularly a student interested in the financing of education.

Pi Lambda Theta Graduate Award–M.A. and Ph.D. levels: To outstanding graduate students of high scholarship, promise in the professional areas of research, teaching, or writing, and striking personal qualities.

Faculty

Members of the College of Education faculty are productive in research and writing and are well qualified by preparation and experience. Ninety-seven percent of the members of the faculty with academic rank hold earned doctorates in their teaching fields, and 95 percent have had teaching or administrative experience in the public schools.

A major strength of the College is its close working relationship with the College of Liberal Arts. With few exceptions, professors on the College of Education faculty also hold academic rank in the College of Liberal Arts. A majority of the professors who teach secondary school methods have doctorates in their teaching disciplines, as well as preparation in education, and hold academic rank both in their academic departments and in education.

Research and Development

The College has a strong history of commitment to educational development and research, as evidenced by the presence of the Lindquist Center for Measurement. In addition to independent research by individual faculty members, several studies are being pursued with the support of foundation and federal grants awarded to divisions and individual staff members. Most members of the faculty are active in professional societies, and several recently have held or now hold key offices in such organizations at the national level. Systematic research programs are sponsored through the Center for Educational Experimentation, Development, and Evaluation.

Nondivisional Programs

Nondivisional programs in the College of Education are administered by coordinators who report to the Office of the Dean. Such programs include those which fall outside of the province of one of the divisions, are interdisciplinary in character, or are of a temporary and experimental nature.

Counselor Education

Chair: E. Richard Dustin
Faculty: *professors* Ursula M. Delworth, E. Richard Dustin, Albert B. Hood, Leonard A. Miller
associate professors Harold J. Adams, Carl S. Davis, Harold B. Engen, Cecelia Foxley, David A. Jepsen, William A. Matthes, Ralph R. Roberts, Jr.
professor emeritus C. Esco Obermann
assistant professors Dianne K. Carter, Nicholas Colangelo, Herbert A. Exum, Gary W. Hobbs, Phillip Jones, Carol R. Loganbill, Charles J. Meade, Lauralee Rockwell, Marlin R. Schmidt, Peter G. Wirtz
instructors Thomas W. Hills, Wayne Mooney, Orville Townsend
Degrees offered: M.A., Ed.S., Ph.D.

The Division of Counselor Education is primarily involved in the training of practitioners and scholars at the graduate level. In addition, however, the Division offers training in interviewing and interpersonal skills for students in other professional and graduate programs as well as some basic courses in these areas for undergraduates.

Student Development Program in Postsecondary Education

M.A. Program

Purpose: Preparation for college positions in admissions, student activities, financial aids, student union, career planning and placement, residence halls, foreign student services, community college counseling, adult continuing education, and external degree programs; and with experience as student deans and college teachers.

Admission requirements: No specific program of undergraduate study or work experience is required, although students considered inadequately prepared will be expected to arrange for makeup courses

while undergoing graduate study. A personal interview is desirable, but not required. Applicants will ordinarily be expected to meet at least one of the following qualifications:

A 3.00 minimum undergraduate grade-point average;
A total score of at least 1,000 on the Graduate Record Examination (aptitude test);
A 550 minimum score on one of the two aptitude portions of the Graduate Record Examination;
Evidence of outstanding leadership in extracurricular activities at an undergraduate institution;
Highly successful experience in the field.

Candidates must also evidence an appropriate level of emotional balance, personality, and interpersonal skills.

Students admitted on a conditional basis will usually be required to earn a 3.00 GPA to be admitted to regular status.

Ed.S. Program

Purpose: To provide specialized professional preparation in college student development beyond the master's level for persons not planning to enter doctoral study; to prepare candidates for such positions as associate dean or dean of students in a small college or as director of admissions, student activities, financial aids, student unions, career planning and placement, residence halls, foreign student services, community college counseling service, adult continuing education and external degree programs; and with experience as college teachers.

Admission requirements: Completion of a master's degree in counseling, student personnel work or closely related areas; 3.00 grade-point average; successful experience in college student personnel work or equivalent experience is preferable.

Ph.D. Program

Purpose: To provide training in depth through an academic research-oriented curriculum which draws heavily upon the field of college student development. Prepares individuals to serve competently in such positions as counselor educator, researcher, associate dean or dean of students, or as director of admissions, student activities, financial aids, student unions, career planning and placement, residence halls, foreign student services, community college counseling service, adult continuing education and external degree programs.

Admission requirements: Same as minimum for Graduate College and M.A. program. Students admitted on conditional basis will usually be required to earn a 3.30 GPA to be admitted to regular status. The M.A. thesis or its equivalent is not necessary for admission to the the Ph.D. program, but to take the Ph.D. comprehensive examination, the student must offer research evidence through his/her M.A. thesis or its equivalent.

Counseling Psychology

Ph.D. Program

Purpose: Prepares doctoral-level counseling psychologists for positions primarily in higher education, usually with academic appointment in counseling psychology and service assignments in counseling centers. Graduates teach courses in counseling, conduct their own research and direct that of their students, supervise counselor trainees, and consult with other student services personnel. Graduates occasionally take service positions in community mental health agencies or private practice.

Admission requirements: Preferably an undergraduate major or minor in psychology, or a major in some related field. GPA of 3.00 or more; successful candidates for admission will typically have GRE (aptitude) scores of 1,150; letters of recommendation. In addition, a personal interview is required before final admission. All application materials must have been received by March 1 of each year; students will be notified about March 15 concerning their applications. Very few students are admitted to the doctoral program each year.

Rehabilitation Counseling

M.A. Program

Purpose: Graduates of the program work in state rehabilitation agencies, sheltered workshops, rehabilitation centers, mental hospitals, prisons, and in other public and private agencies concerned with the rehabilitation of the handicapped.

Admission requirements: Same as minimum requirements for Graduate College. In addition, a personal interview is highly desirable. Applications are reviewed March 1, for fall admissions only.

Ph.D. Program

Graduates are prepared to provide leadership in college and university programs of rehabilitation counselor education and research programs within universities and state agencies.

Admission requirements: Same as minimum requirements for Graduate College. In addition, applicants who have recently graduated from an M.A. program in rehabilitation counseling, and who have not had at least one year of full-time work experience in rehabilitation counseling, must submit a written explanation for not undertaking such work experience prior to admission to the doctoral program. Such work experience is viewed as highly desirable and applicants without such experience will receive lower priority than applicants with such experience. Applications are reviewed March 1 for fall admissions. M.A. thesis or equivalent necessary.

School Counselor Education

M.A. Program

Purpose: To prepare individuals to function as counselors in a variety of settings.

Admission requirements: In addition to the Graduate College's minimum requirements, the faculty of the School Counselor Education program requires a minimum undergraduate grade-point average of 2.50 and the completion of specific forms by the applicant and his/her references. These forms will be sent by the Office of Student Personnel, College of Education.

Ed.S. Program

Purpose: To give an individual seeking preparation beyond the master's degree an opportunity to increase his/her competence as a counselor or supervisor of counselors.

Admission requirements: To be admitted to the program, an applicant must possess a master's degree or its equivalent in counseling and have experience as a counselor. The applicant must have at least

a 3.00 minimum grade-point average on all graduate study. The forms the applicant must complete to be considered for admission to this program will be sent by the Office of Student Personnel, College of Education.

Ph.D. Program

Purpose: To prepare individuals for teaching, leadership, and research positions in the field of counseling.

Admission requirements: The applicant must have a minimum graduate grade-point average of 3.25 and perform satisfactorily on the Graduate Record Examination. Also, the applicant should possess a master's degree or its equivalent in a counseling area.

Special Program in Drug Counseling

A federally-funded program leading to a drug counseling specialty is available as a minor area along with other M.A. programs in counselor education.

Special Facilities

A wide variety of practicum experiences is available to students in the various programs in counselor education in a large number of settings in neighboring community agencies, schools and colleges as well as in many agencies throughout the University.

Financial Aid

Graduate training fellowships are available (dependent upon federal funding) for students entering the Rehabilitation Counseling and Drug Counseling programs. Many other graduate students in the Counselor Education Division hold a wide variety of part-time graduate assistantships. For example, many of the University's student service units award part-time assistantships to graduate students in the College Student Personnel Program. Applicants for assistantships should contact the coordinator of the particular counselor education graduate program they plan to enter.

Courses

For Undergraduates and Graduates

Counseling and Guidance

7C:81 Making a Vocational-Educational Choice 2 s.h.
Directed toward those students who are uncertain about their educational and vocational goals; special emphasis given to the vocational decision-making process, self-evaluation and exploration of the world of work.

7C:110 Process of Change and the Counselor 2-3 s.h.
Laboratory course focusing upon strategies other than one-to-one relationships model to bring about change in human systems. Prerequisite: consent of instructor.

7C:112 Human Sexuality 1-3 s.h.
Exploration of physiological and psychological aspects of human sexuality. Same as 42:112, 17:117, 96:112.

7C:116 Human Relations for Service Professions 3 s.h.
Includes awareness of racism and sexism influences within social systems.

7C:133 The Culturally Different in Educational Settings 3 s.h.
Problems in teaching culturally different child of school age; relevant research on impact of disadvantaged background on learning potentials of students. Same as 7U:133.

7C:140 Sex Role Stereotyping and Socialization in Education 2-3 s.h.
Consideration of part education plays in socialization of sexes; schools' reinforcement of sexual stereotyping analyzed and alternative educational approaches and strategies for change discussed. Same as 7F:140.

7C:150 Psychological Aspects of Women's Roles 1-3 s.h.
A consideration of how rigid sex roles limit the potency and humanity of women.

7C:155 Psychological Aspects of Black Behavior and Personality 3 s.h.
Course examines the body of literature which explains the behavior of Americans of African descent from an African (Black) perspective; basic issues include psychological assessment of Black people, personality and motivation, counseling theory, perspectives on racism, the Black family, the role of Black psychologists in the community, and the education of Black people. Same as 45:155.

7C:160 Values and Morality in School 2 s.h.
Theories and research in values and moral education; design and practice of classroom activities on values and morals.

7C:170 Human Relations for the Classroom Teacher 1-2 s.h.
Relationship between parents and teachers; teachers and pupils; teachers and other school personnel; teachers and community.

7C:171 Human Relations II for the Classroom Teacher 2-3 s.h.
Develops awareness of values, life-styles and history of various subgroups in U.S. society and understanding of such dehumanizing biases as racism, sexism, prejudice and discrimination; also includes training in communication and interpersonal human relations skills.

7C:180 Workshop in Counselor Education arr.
Designed to provide topics for the continuing education of counselors and related professionals.

7C:185 The Drug Culture 2-3 s.h.
A consideration of attitudes, values, language, artifacts and myth; specific information on street drugs; personality correlates of drug use and abuse.

7C:187 Management and Motivation in Organizations and Activities 1-3 s.h.
Foundations of roles and management of student organizations, development of individual leadership ability and group leadership skills, techniques of managing organizations. Prerequisites: participation in a recognized student organization and permission of instructor.

7C:190 Training Group Processes 2-3 s.h.
Small group procedures used for personal and organizational development in educational settings; demonstrations supplement discussions of theoretical issues and research findings; primary emphasis on individual's reactions to information and experiences associated with various group procedures; includes participation in personal growth group. Prerequisite: consent of instructor. Same as 42:190.

7C:193 Individual Instruction in Counselor Education: Undergraduate arr.
Prerequisite: consent of instructor.

7C:199 Counseling for Related Professions 2-3 s.h.
Introduction to counseling theory and techniques for persons who are entering professions that require them to engage in helping relationships with clients; experiential methods used to build effectiveness in skills and to explore dynamics of helping.

7C:201 Student Appraisal Procedures 2-3 s.h.
Techniques for administering and interpreting student appraisal devices in elementary and secondary school guidance programs; nonstandardized test devices; case study procedures.

7C:202 Introduction to Group Counseling 3 s.h.
Survey of research, theory and practices in group counseling; includes experience of participating in groups and examination of various leadership styles. Open only to majors in counseling and related fields.

7C:203 Pre-Practicum in Counseling 1-2 s.h.
Structured field experience, to be taken before the practicum in school guidance, designed to facilitate understanding of variety of counselor behavior in settings. Majors in school counselor education only.

7C:209 Counseling the Culturally Different 3 s.h.
General overview of culturally different persons, both rural and urban; educational aspects concerning the culturally different with special emphasis on counseling methods and techniques.

7C:212 Helping Relationships: Philosophy, Process and Procedures 3-4 s.h.
Introductory course designed to explore various aspects of helping professions associated with educational and community settings. Prerequisite: consent of instructor.

7C:220 Counseling of Children and Parents 3 s.h.
Survey of methods, procedures and research related to counseling of children and parents. Prerequisite: consent of instructor. 7C:221 or 7C:199 recommended.

7C:221 Foundations of Counseling 3-4 s.h.
Introductory course designed to examine philosophical basis, process and issues surrounding predominant counseling theories and techniques. Prerequisite: consent of instructor.

7C:223 Pre-Practicum in Counseling Psychology 1 s.h.

7C:241 Introduction to Rehabilitation Services 2 s.h.
Historical and legal background of rehabilitation; roles of rehabilitation workers and nature of rehabilitation resources.

7C:242 Rehabilitation Counseling 2 s.h.
Counseling process in rehabilitation setting; appraisal and counseling procedures. Prerequisite: consent of instructor.

7C:247 Medical Aspects of Disability 3 s.h.
Orientation to medical evaluation as part of rehabilitation process; body systems, medical terminology and medical description of disabilities of importance to counselors; integration of medical information with social, psychological and vocational aspects of disabling conditions.

7C:254 Appraisal in Counseling 3 s.h.
Critical survey of research on aptitude, interest and personality tests used in vocational counseling and personnel selection; laboratory practice in test administration, scoring, interpretation and reporting.

7C:255 Vocational Psychology 3 s.h.
Comprehensive review of the major concepts in vocational theory and the consideration of theories of vocational choice, adjustment and development.

7C:260 Issues and Application in Counseling Women 3 s.h.
The focus will be on counseling women for psychological equality; content will center on antecedents of the current attitude toward women and various special counseling techniques. Prerequisites: courses or experience in counseling.

7C:262 Marriage and Family Counseling 3 s.h.
An advanced course in counseling theory and techniques as applied to problems of marriage and the family. Prerequisites: basic counseling courses and consent of instructor.

7C:263 The Counselor as Consultant 2-3 s.h.
Study and discussion of the role of the counselor as an organization and community consultant: selected theories, approaches and applications. Prerequisites: enrollment in counselor education program or related areas and consent of instructor.

7C:270 Issues and Trends in School Guidance 2-3 s.h.
Survey of research and authoritative opinion on current issues concerning school guidance: trends in school guidance and counselor education.

7C:280 Topical Seminar in Counselor Education arr.
Special topics dealing with contemporary problems of concern to counselors in specific settings. May be offered for portions of semester. May be repeated.

7C:285 Drugs and the Counselor 3 s.h.
Special topics dealing with relationship of personality to drug taking; emphasizes development and evaluation of differential treatment models; critical survey of ethical issues, drug policy and other drug-related issues. Prerequisite: consent of instructor.

7C:288 Internship in Drug Counseling arr.
Supervised practice in counseling clients with drug-related problems; for students enrolled in the drug counseling program. Prerequisite: consent of instructor.

7C:290 Practicum in Group Facilitation arr.
Supervised practice in working as cofacilitator and/or as facilitator in counseling groups and other types of growth groups. Prerequisites: 7C:202 and consent of instructor.

7C:293 Individual Instruction in Counselor Education arr.
Prerequisite: consent of instructor.

7C:300 Counseling: Altered States of Awareness 2-3 s.h.
Class events focus on human consciousness (as internally experienced) and the role of conditioning in the maintenance of such experiences. Meditation, biofeedback, sensory deprivation, as well as hypnosis, are examined, both in discussion and experientially. These are related to counseling strategies. Prerequisite: consent of instructor.

7C:302 Practicum in Counseling arr.
Provides experience in each phase of school counselor's role; elementary school, junior high school, senior high school, community college or other setting; major emphasis on counseling procedures. Prerequisite: consent of instructor.

7C:305 Seminar: The Normal Personality 2-3 s.h.
Study of normal development of personality in coping with key life tasks and problems at different life stages; life tasks include interpersonal relations, self-concept development, role assumption in social context, etc.; seminar focuses on implications of normal personality for counselor behavior and interaction.

7C:330 Introduction to Student Services 3 s.h.
History, philosophy and status of student personnel services; emphasis on case study approach to personnel planning and decision making.

7C:331 The College Student 2-3 s.h.
Psychological and sociological characteristics of college students and implications for higher education.

7C:332 Seminar: Student Services 2-3 s.h.
Intensive study and seminar presentation of current issues, problems and conflicts related to certain areas of student personnel administration in higher education; may be repeated. Prerequisite: consent of instructor.

7C:333 Practicum in Student Services arr.
Supervised practice in college student personnel agencies. May be repeated. Prerequisite: consent of instructor.

7C:335 Administration of Student Services 3 s.h.
Organization theory, theories of administration, personnel administration, human relations and other aspects of management for college student personnel workers.

7C:336 Seminar: College Student Services Research 1, 3 s.h.
Lectures, discussions and seminars on selected college student personnel research studies. May be repeated for credit.

7C:337 Seminar: Readings in Research on Equal Access 2 s.h.
Study of research reports and state of the arts papers on the development of equality of opportunity components in higher education. Emphasis will be given to relevant research in college student personnel and higher education.

7C:341 Seminar: Placement in Vocational Rehabilitation 1 s.h.
Prerequisite: consent of instructor.

7C:342 Seminar: Psychological Aspects of Disability 1 s.h.
May be repeated.

7C:351 Supervised Practice in Rehabilitation Procedures arr.
May be repeated. Prerequisite: consent of instructor.

7C:352 Supervised Field Work: Rehabilitation Procedures arr.
Full-time work; taken on projected registration basis. Prerequisite: consent of instructor.

7C:353 Advanced Counseling and Psychotherapy 3 s.h.
Theories and techniques of counseling clients with personal and interpersonal problems. Prerequisites: 7C:434, 7C:221.

7C:354 Experimental Approaches in Counseling Research 2-3 s.h.
Application of experimental methodology and laboratory procedures to study of counseling and vocational phenomena. May be repeated for credit. Prerequisite: consent of instructor.

7C:355 Counseling Processes and Outcomes 3 s.h.
Gives student basic knowledge of state of outcome and process research on various counseling and psychotherapeutic procedures. Prerequisite: Ph.D. candidacy in appropriate field, or master's candidacy with consent of instructor.

7C:356 Student Services Program Development 3 s.h.
Review of literature on outreach activities of counseling centers and community mental health programs; participation in an outreach activity and evaluation of that activity. Prerequisite: 7C:453 or concurrent enrollment in 7C:453.

7C:357 Seminar: Group Counseling and Psychotherapy 3 s.h.
Survey of theories and techniques of group counseling and psychotherapy; integration of theory into supervised experience and research on group counseling. Prerequisite: 7C:453.

7C:360 Advanced Practicum in School Guidance arr.
Supervised practice in counseling; intensive analysis of counselor styles and methods; for advanced graduate students enrolled in school counselor education program. Prerequisite: consent of instructor.

7C:365 Behavioral Counseling 3 s.h.
Familiarizes qualified graduate students with technology of behavior therapy; emphasis on practical application, background theory and research are presented. Prerequisites: graduate student in appropriate field and consent of instructor.

7C:380 Practicum in College Teaching arr.
Provides qualified, advanced graduate students with supervised college teaching experience in counselor education courses. Includes teaching in collaboration with faculty, observation and critiques of staff teaching, and participation in course planning and evaluation procedures. Prerequisite: consent of instructor.

7C:393 M.A. Thesis in Counselor Education arr.
Prerequisite: consent of instructor.

7C:395 Educational Specialist Research in Counselor Education arr.
Prerequisite: consent of instructor.

7C:434 Practicum in Counseling Psychology arr.
Supervised practice in counseling services. May be repeated. Prerequisites: 7C:221 and 7C:254 or equivalents, and consent of instructor.

7C:453 Advanced Practicum in Counseling Psychology arr.
Half-time or more supervised work as an intern in counseling services. Prerequisites: 7C:434 or equivalent, and consent of instructor.

7C:454 Seminar on Counselor Supervision 3 s.h.

7C:455 Supervising the Counseling Practicum arr.
Supervision of students enrolled in counseling practicum. Prerequisite: consent of instructor.

7C:460 Seminar: Research in Counseling 1-3 s.h.
Prerequisite: consent of instructor.

7C:465 Ethics and Issues in Counseling Psychology 2 s.h.

7C:493 Ph.D. Thesis in Counselor Education arr.
Prerequisite: consent of instructor.

Educational Administration

Chair: George A. Chambers
Faculty: *professors* George A. Chambers, Walter J. Foley, Howard R. Jones, Jerry N. Kuhn, Willard R. Lane, Bradley M. Loomer, John E. McAdam, Franklin D. Stone
professors emeriti Henry C. DeKock, Wesley E. Erbe
associate professor Owen L. Springer
assistant professors John B. Cox, William C. Bozeman
Degrees offered: M.A., Ed.S., Ph.D.

To be eligible for recommendation by The University of Iowa for certification in Iowa to function as an elementary principal, secondary principal, or superintendent, an individual must:

Hold or be eligible to hold an Iowa Permanent Professional Teaching certificate;
Have a minimum of four years of successful teaching experience with a valid teaching certificate;
Have completed at least 20 graduate semester hours of credit from the University; and
Have a master's degree.

In addition, each certificate has these requirements:

Elementary Principal (Endorsement 11): Completion of the educational administration program with elementary school emphasis;
Secondary Principal (Endorsement 22): Completion of the educational administration program with secondary school emphasis; and
Superintendent (Endorsement 62 61): 60 semester hours of graduate work in a planned program in general school administration, including courses listed in the general school section of the Ed.S. program, or such equivalent courses as the individual's adviser recommends.

M.A. in Educational Administration

The purpose of this program is to prepare individuals for appointments as elementary or secondary school principals, central staff, certain positions with state departments of education, or positions with area education agencies.

The thesis program is recommended for students who plan to do graduate work for an advanced degree or who have a special interest in research.

Ed.S. in Educational Administration

The purpose of this program is to prepare students for appointments as superintendents of schools, in state departments of education, area education agencies, or the U.S. Office of Education, and to assist school administrators in upgrading their administrative skills.

Ph.D. in Educational Administration

The purpose of this program is to prepare students for positions at all levels of school administration or to teach educational administration at the college level or university level.

Admission

Applicants must satisfy minimum requirements of the Graduate College. Candidates are selected through faculty review. Factors considered include grade-point average, Graduate Record Examination scores, and other evidence of academic ability and professional promise.

Courses

Educational Administration

7D:198 The Teacher, the Law and Negotiations 2 s.h.
Rights, privileges, restraints, and liability of teacher and student; negotiations law, regulation, issue development, negotiation procedures, impasse procedures; actual problems of educators relating to state statutes and court decisions. Prerequisite for undergraduates: 7E:91 or 7S:91 or consent of instructor.

7D:201 Foundations of School Administration 3 s.h.
Introductory course. Organization and administration of American public education; principles and concepts of organization and administration; socio-economic, political, and professional factors relating to education and school administration.

7D:203 Computer Applications in Education 2-3 s.h.
Principles of educational data processing and computers with applications to educational administration, management information systems, instruction, and research.

7D:204 Educational Systems Analysis and Operations Research 2-3 s.h.
Application of systems analysis and operations research methods to educational systems, planning and design.

7D:260 Secondary School Principal 3 s.h.
Roles and responsibilities of secondary school administrators in planning and implementing the educational program, staff selection, utilization and improvement, providing appropriate student personnel services and the direction of managerial opportunities.

7D:261 Elementary School Principal 3 s.h.
Organization, supervision and administration of elementary schools, curriculum leadership, instructional practice and personnel relationships; role analysis and communication channels; basic requirement in administration program.

7D:262 Elementary School Organization Patterns 3 s.h.
Organizational approaches analyzed with specific attention devoted to emerging patterns; attention given to new trends in instructional procedures.

7D:289 Seminar: Systems Evaluation in Educational Decision-Making 2-3 s.h.
Development of strategies, processes and mechanisms of evaluation and design; centers on information and covers the collection, organization, formatting and retrieval of information, development of criteria for evaluation and program administration.

7D:290 School-Public Relations 2-3 s.h.
Relationships between public school as social institution and community; basic concepts, propaganda and democratic process, agents of interpretation; most of emphasis on field work.

7D:291 Administration of Professional Personnel 2-3 s.h.
Problems of administering personnel, including procurement, employment, induction, inservice development, salary, welfare, and collective bargaining.

7D:292 School Buildings and Sites 2 s.h.
Comprehensive study of planning of educational facilities, from identification of need through utilization of the facilities, including developing educational specifications, selection of architect, selection of site, financing construction, legal aspects.

7D:293 Individual Instruction in Educational Administration arr.
Prerequisite: consent of instructor.

7D:294 State and Federal Financing of Public Education 2-3 s.h.
Economic implications of public education; determination of policy and practice in financing of public schools by local, state and federal agencies; developing principles of adequate tax programs and designing systems of state support of public education.

7D:295 Financial Management of Local School Systems 3 s.h.
Overview of school business administration and role of school business official, with emphasis on fiscal management, including budgetary procedures, uniform accounting techniques, and capital outlay funding.

7D:297 Theory in Administration 3 s.h.
Administrative process; leadership and organizational behavior in educational systems; application of developing theoretical constructs to the description, analysis and methodology of adminstrative behavior.

7D:298 Legal Aspects of School Personnel 2-3 s.h.
Emphasis on the teacher and student with some attention to the principal, superintendent, board member and parents; includes liability, negotiations, rights, privileges and responsibilities of school personnel; examines principles of law derived from court decisions; constitutional and statutory provisions. Designed for teachers and administrators.

7D:299 Legal Aspects of School Administration 2-3 s.h.
Emphasis on nonpersonnel concepts in education, including organization, property, finance, religion, segregation and intergovernmental relations; use of constitutional and statutory provisions plus court decisions. Designed primarily for administrators but applicable to teachers.

7D:301 Seminar: Urbanization arr.
Problems of urban centers related to education, city government, institutions; small-scale research projects developed by students; specialists in urban problems used as resource people. Same as 34:279, 30:324.

7D:303 Seminar: Administration and Coordination of Curriculum 2-3 s.h.
For advanced students having prior coursework in administration and curriculum; opportunity to do intensive work in specific problems associated with the administration of curricular development, implementation, and appraisal efforts.

7D:304 Seminar: Elementary Supervision and Administration 2-3 s.h.
For experienced supervisors and administrators; in-depth study of issues of major significance to elementary school organizational and instructional practice; evaluation of prior research and consideration of research proposals. Prerequisites: 7D:261 or equivalent and consent of instructor.

7D:323 Seminar: Problems in Public Administration 3-4 s.h.
Exploration of structure and functioning of school government and general government; status and trends in school intergovernmental relations; precipitating forces promoting improved school-intergovernmental relations; model building.

7D:350 Seminar: Computer Applications in Education 2-3 s.h.
Research and practice in application of computer to educational administration, instruction, and research. Prerequisites: 7D:203, 7D:204.

7D:360 Seminar: School Business Management Administration 1-3 s.h.
Problems of school business management, with emphasis on contemporary issues; student should be able to conduct self-studies in local school districts as result of course. Prerequisite: 7D:295.

7D:361 Seminar: The Economics of Education arr.
Exploration of the relationship between education and economics, including supply and demand, resource allocation and productivity, educational planning, efficiency and effectiveness. Prerequisite: 7D:294.

7D:370 Seminar: Research Design 1-4 s.h.
For graduate students working toward doctorate; developing dissertation topic and prospectus; defining problem, methods of data gathering, design, language, form.

7D:371 Research Practicum arr.
Small-scale research projects (graded in difficulty) developed and assigned; supervised experience in planning, design, management, analysis and reporting of research activities; student assumes major responsibility; assignments to current and personal faculty research projects. Prerequisite: consent of instructor.

7D:375 Educational Administration Practicum arr.
Supervised experience in working with educational administration problems including organization, planning, evaluation and decision making.

7D:377 Seminar: Organizational Theory and Educational Theory and Educational Administration 3 s.h.
Students select work of particular theorists or theoretical systems and develop papers for presentation and discussion. Prerequisites: 7D:201, 7D:297, Ph.D. candidacy, and consent of instructor.

7D:380 Seminar: Value Problems in the Administration of American Education 3 s.h.
Philosophical and sociological ideas underlying American system for administration of public education; various ideas as to place of both conformity and dissent in democratic society and democratic educational system; contemporary issues. Same as 7F:380.

7D:381 Analysis and Appraisal of Curriculum 2-3 s.h.
Comprehensive investigation of systematic procedures for identifying and evaluating the essential features and constituent elements of a given school district's curricular offering. Appropriate administration, curriculum, and supervision programs or positions.

7D:383 Supervision of Instruction 2-3 s.h.
Problems and procedures in working effectively with teachers and staff groups. Analysis of appraisal of teaching research findings. Designed for administrators and supervisors at both the central office and building levels. Strong emphasis on recognition of instructional adaptations appropriate to diverse student populations.

7D:384 Workshop for Education Executives 0-4 s.h.
Intended for practicing school administrators; emphasis on problem solving within an organization; specific problems determined by administrators attending.

7D:390 Selected Topics in Educational Administration arr.
Individual and group investigation of contemporary problems and issues in educational administration. Prerequisites: 7D:201 and consent of instructor.

7D:391 Seminar: Case Studies in School Administration 2-3 s.h.
Administrative problems and issues experienced in actual school situations; construction and/or discussion of cases using theoretical models and theory. Open to people who have studied one other course in administration or who have had some administrative experience. Prerequisites: former course 7:191 or 7D:201 and consent of instructor.

7D:392 Field Service Project in Educational Administration arr.
Prerequisite: consent of instructor.

7D:393 M.A. Thesis in Educational Administration arr.
Prerequisite: consent of instructor.

7D:395 Educational Specialist Research in Educational Administration arr.
Prerequisite: consent of instructor.

7D:493 Ph.D. Thesis in Educational Administration arr.
Prerequisite: consent of instructor.

Early Childhood and Elementary Education

Chair: Jerry N. Kuhn
Faculty: *professors* Jack Bagford, Louise Beltramo, Beatrice A. Furner, Jerry N. Kuhn, Bradley M. Loomer, Lloyd L. Smith
associate professors Mildred A. Laughlin, Dorothy T. McDonald, William H. Nibbelink, Darrell G. Phillips, Richard D. Shepardson, James A. Shymansky, Margaret G. Weiser, Marilyn Zurmuehlen
assistant professor Alfredo H. Benavides, Jerry Watson
Degrees offered: B.A., B.S., M.A., M.S., Ph.D.

The programs offered by the Division are designed to prepare graduates for employment in specific positional roles in public schools and institutions of higher learning. All programs have been approved by the Iowa Department of Public Instruction and meet National Council for Accreditation of Teacher Education approval standards.

Undergraduate Programs

Early Childhood Education

Early childhood teaching requires an understanding and appreciation of young children from infancy through the early elementary school years, and competence in encouraging and enhancing the growth and development of the total child.

Preparation for early childhood teaching involves study of child development, parent-child relationships, and organization and administration of child care centers, in addition to curriculum and methodology appropriate for young children. The program involves wide reading, creative planning, and application of knowledge in working with groups of young children in public or private early childhood centers or classrooms. The early childhood education program is designed specifically to prepare students to teach children in infant-toddler groups, in classes for three-, four-, and five-year-old children, and in kindergarten and meets the requirements of the Iowa endorsement number 53 for prekindergarten/kindergarten teachers.

Students interested in dual certification at the prekindergarten/kindergarten level and the kindergarten/elementary level should follow the elementary education program with the early childhood area of specialization resulting in endorsement numbers 10 and 53.

Program Requirements

Special Core Requirement

Students majoring in early childhood, elementary and/or special education should complete the special science-mathematics foundation designed for them. Completion of this core requirement is a prerequisite to enrolling in 7E:162 Methods: Elementary School Science and 7E:163 Methods: Elementary School Mathematics. This prerequisite may be satisfied in one of three ways:

- Satisfactory completion of the special courses 97:55-56, and 22M:80; or
- Satisfactory completion of equivalent courses at another four-year approved college or university; or
- Prior completion of 8 s.h. of other science and/or mathematics courses which satisfy the College of Liberal Arts natural science core requirement, and the passing of special tests dealing with the content of 97:55-97:56 and 22M:80.

Students not passing the science examination must register for 97:104. Students not passing the mathematics examination must register for 22M:80.

Foundations Courses

7P:75 Educational Psychology and Measurement 3 s.h.
7E:100 Introduction: Elementary and Early Childhood Teaching 3 s.h.
7W:91 Audiovisual Equipment for Instruction 1 s.h.

Undergraduate students should complete the foundations courses in their sophomore year. Graduate students may elect equivalent graduate-level courses with the approval of their advisers.

Major Courses

Minimum course requirements which must be completed before student teaching:

17:10 Growth and Development of the Young Child 3 s.h.
or
7P:106 Child Development 3 s.h.
or
31:14 Introduction to Child Psychology 3 s.h.

17:124 Nutrition Work with Children 3 s.h.
7E:120 Methods and Materials: Music for the Classroom Teacher 3 s.h.
7E:122 Methods and Materials: Art for the Classroom Teacher 3 s.h.
7E:126 Literature and Storytelling for Children 3 s.h.
7E:157 Methods: Early Childhood Education I 3 s.h.
7E:91 Pre-Education Practicum 1 s.h.
(to be taken concurrently with 7E:157)
7E:167 Methods: Early Childhood Education II 3 s.h.
7E:91 Pre-Education Practicum 1 s.h.
(to be taken concurrently with 7E:167)

Additional courses required to complete the early childhood education major (may be taken before or after student teaching):

17:114 Parent-Child Relationships 3 s.h.
42:125 Child Care Centers: Development and Administration 3 s.h.
7U:133 The Culturally Different in Educational Settings 3 s.h.

7E:165 Methods: Multicultural-Bilingual Education 3 s.h.
or
7E:195 Multicultural Concepts and Educational Systems 3 s.h.

Student Teaching

Students should make application to the College of Education by March 15 preceding the academic year during which they plan to do their student teaching. Students register for 7E:158 Supervised Teaching in an Early Childhood Center. The student teaching period is one full semester for 15 semester hours of credit. No additional coursework may be taken during the student teaching semester.

Areas of Specialization

A minimum of three courses (or nine semester hours) from an area of specialization is required. The areas of specialization offered for early childhood education majors are child and family services, the family, child growth and development, language development, and educational needs of special children.

Students seeking Iowa Department of Public Instruction approval to teach preschool handicapped should select the educational needs of special children as their area of specialization and in addition to the major must complete all of the following courses:

7U:130 Exceptional Children 3 s.h.
7U:135 Mental Retardation 3 s.h.
7U:139 Orientation to Rehabilitation of the Physically Handicapped Child 3 s.h.
7U:120 Methods of Teaching Preschool Handicapped 3 s.h.
7U:136 The Trainable and Subtrainable Mentally Retarded Child 2-3 s.h.
3:118 Psychology of Language II 3 s.h.
7U:193 Laboratory Practice in Education of Preschool Handicapped Children 7 s.h.

The student should consult with his/her adviser concerning the choice of the area of specialization. Copies of the requirements for each area of specialization are available in the College of Education office and at the Early Childhood and Elementary Education Division office. Courses in the area of specialization may be taken pass-fail if this option is offered for them.

Elementary Education

Elementary teachers guide the learning experiences of children during the approximate age period 5-12 years. They serve in a variety of school organizational patterns including self-contained rooms wherein the teacher assumes responsibility for most of the curricular areas, departmental positions wherein their responsibilities are concentrated in one or two subject areas, and team teaching assignments wherein two or more teachers assume shared responsibility for the total instructional endeavor.

Preparation for elementary teaching involves: the acquisition of a broad general education background; in-depth study of at least one elementary curriculum subject area; and professional study of the learning process, the selection and structure of curricular materials suitable for school age children, and the methodological procedures most appropriate for presenting these materials. Study in the program is rigorous. It involves wide reading, creative planning and application of knowledge in the classroom.

The elementary education program is designed specifically to prepare students to teach kindergarten through sixth grade. Special sequences are also available for students seeking the prekindergarten/kindergarten endorsement and for those seeking approval for teaching in middle schools or junior high schools.

Students interested in certification for elementary teaching and approval for special education should note the requirements for admission to each of these programs. Students interested in this combination must make a separate application to each program and these applications will be considered independently.

Program Requirements

Special Core Requirement

See description under Early Childhood Education.

Foundation Courses

7E:91 Pre-Education Practicum or equivalent experience (7E:91 must be taken concurrently with 7E:100) 2 s.h.
7E:100 Introduction: Elementary and Early Childhood Teaching 3 s.h.
7P:75 Educational Psychology and Measurement 3 s.h.
7W:91 Audiovisual Equipment for Instruction 1 s.h.

Undergraduates should complete these in their sophomore year. Graduate students may elect equivalent graduate-level courses with the approval of their advisers.

Methods Sequence

7E:160 Methods: Elementary School Language Arts	3 s.h.
7E:161 Methods: Elementary School Social Studies	3 s.h.
7E:162 Methods: Elementary School Science	2 s.h.
7E:163 Methods: Elementary School Mathematics	2 s.h.
7E:164 Methods: Elementary School Reading	3 s.h.

The elementary methods sequence must be completed before the student will be eligible for student teaching.

Student Teaching

Students should make application to the College of Education by March 15 preceding the academic year during which they plan to do their student teaching. Students elect 7E:191 Supervised Teaching in an Elementary School or 7E:192 Laboratory Practice in Elementary School; 7U:191 Laboratory Practice in Education of the Physically Handicapped Child; 7U:192 Laboratory Practice in Education of the Mentally Retarded Child; and 7E:158 Supervised Teaching in an Early Childhood Center may also be be elected where appropriate. The student teaching period is one full semester for 15 semester hours of credit. No additional coursework may be taken during the student teaching semester. No more than two certifiable student teaching experiences may be taken in a given semester.

Areas of Specialization

An area of specialization is required in a teaching field. The areas of specialization offered are elementary art, bilingual education, early childhood, health education, elementary language arts, elementary mathematics, multicultural education, elementary music, elementary reading, elementary physical education, elementary science, elementary social science, special education, and elementary generalist.

The student should consult with his or her adviser concerning courses which will serve to strengthen preparation for teaching in a subject area and meet the specific requirements for that area. Copies of the requirements for each area of specialization are available in the College of Education Office and at the Early Childhood and Elementary Education Division Office. Courses in the area of specialization may be taken pass-fail if this option is offered for them.

Graduate Programs

M.A. in Elementary Education

This degree program, which may be taken with (30 s.h. minimum) or without (32 s.h. minimum) thesis, is designed to prepare master's candidates in elementary education to serve as team leaders, grade-level or subject area supervisors, or curriculum consultants. Successful completion of this degree together with four years of successful teaching experience qualifies the student for certification as an elementary school supervisor, Iowa endorsement number 12.

Only one course, Elementary Curriculum, is specifically required of all candidates but each candidate must elect at least one course from each of three areas: social foundations, educational psychology and measurement, and supervision. In addition, each candidate must complete an area of specialization and selected coursework in advanced methodology.

M.S. in Elementary Science

This degree program, which may be taken with (30 s.h. minimum) or without (34 s.h. minimum) thesis, is designed to prepare master's candidates in elementary education to serve as team or departmental science specialists. The admission requirements are the same as those established by the Graduate College and, in addition, the applicant must have completed an undergraduate program of teacher preparation equivalent to that required for Iowa Elementary Teaching endorsement number 10. Prior to completion of the degree, the applicant must have one year of successful teaching experience.

Four courses are required of all candidates:

7E:262 Advanced Techniques of Teaching Science in the Elementary School	3 s.h.
7E:302 The Science Curriculum in the Elementary School	2-3 s.h.
7S:350 Seminar: Science Education	1 s.h.
7E:362 Current Readings in Science Education	2 s.h.

In addition, all candidates must complete a concentration of 16-20 s.h. of coursework in at least two science areas. Courses selected for the concentration, and all remaining elective hours, must be approved by the adviser.

M.A. in Developmental Reading

This program, which may be taken with (30 s.h. minimum) or without (32 s.h. minimum) thesis, is designed to prepare graduate students for positions as reading specialists in kindergarten and grades 1-12. Successful completion of this program, together with four years of successful teaching experience, qualifies the student for certification as a Reading Specialist, Iowa endorsement number 54.

The following are required of all candidates:

7E:171 Reading Clinic: Teaching Techniques	2-3 s.h.
7E:172 Reading Clinic: Teaching Practicum	2-3 s.h.
7E:264 Building Foundations for Reading: Pre-Primary and Primary	2-3 s.h.
7E:265 Supervision of Intermediate Grade Reading	3 s.h.
7S:194 Methods: High School Reading	2-3 s.h.
7E:364 Seminar: Elementary Reading	2-3 s.h.
or	
7S:294 Seminar: Secondary Reading	arr.

In addition, candidates must complete one or more courses each in the curriculum, supervision, and social foundations areas. Remaining elective hours are selected with the adviser's approval.

Ph.D. in Elementary Education

The purpose of this program is to prepare students for college and university teaching and research positions in elementary education and for research, curriculum, supervisory, or administrative positions in public school systems and governmental educational agencies.

The program requires a minimum of 90 semester hours, including hours earned for the dissertation. The plan of study for each student is prepared on an individual basis in consultation with an adviser. The final plan of study must be approved by the adviser and the Division chair.

As a general guideline, each student is expected to have a good general background in all facets of elementary school education and a very strong area of specialization in at least one facet. Commonly selected specialization areas are

elementary school administration, children's literature, early childhood, curriculum, language arts, mathematics, reading, and social studies.

Each doctoral student must also complete a cognate or related field of concentration. The external field may be a professional specialization, such as educational psychology and measurement, special education, or general school administration; or it may be a subject field, such as English.

In addition, all students must demonstrate competency with respect to appropriate research tools, most commonly statistical analysis and data processing.

Financial Assistance

A number of teaching assistantships are available for graduate students pursuing advanced programs in early childhood and elementary education. Specific assignments vary. Some assistantships involve teaching in the Early Childhood Education Center; some involve the supervision of undergraduate majors enrolled in 7E:91 Pre-Education Practicum; and some involve the teaching of sections of undergraduate methods courses and the supervision of student teachers. Most assistantships are classified as one-half time. This classification permits students to register for a maximum of 12 s.h. of credit per semester. Holders of assistantships must register for a minimum of nine semester hours per semester.

All assistantships are awarded on a competitive basis. To be considered for an assistantship an applicant must have been admitted on regular status to the Graduate College and have been accepted in an advanced program by the College of Education. Inquiries concerning assistantships should be directed to the Division chair.

Courses

7E:71 Methods and Materials: Elementary School Physical Education 2 s.h.
For physical education majors only. Same as 28:71.

7E:72 Methods and Materials: Elementary School Physical Education 2 s.h.
For physical education majors only. Prerequisite: 7E:71 or consent of instructor. Same as 28:72.

7E:91 Pre-Education Practicum 1-2 s.h.
Involves working with children and teachers in elementary schools and early childhood centers at least ten hours per week for each semester hour of credit; basic objective is to help University students assess their own potentialities and interest in teaching as a career. Elementary education majors should register for 2 semester hours concurrently with 7E:100; early childhood majors should register for 1 semester hour concurrently with 7E:157 and 1 semester hour concurrently with 7E:167.

7E:100 Introduction: Elementary and Early Childhood Teaching 3 s.h.
Meets requirements for elementary certificate; opportunities, requirements and responsibilities in teaching.

7E:101 Introduction to Education 3 s.h.
Same as 7S:101.

7E:102 Nutrition Work with Children 3 s.h.
Child nutrition; approaches and techniques currently used in nutrition education of children. Prerequisite: 17:41 or consent of instructor. Same as 17:124.

7E:104 Remedial Methods in Speech and Hearing 2 s.h.
Emphasis on elementary grades; usually taken in conjunction with 7E:192, which provides approximately 70 clock hours of supervised clinical practice in elementary schools. Primarily for speech pathology and audiology majors. Prerequisite: consent of instructor.

7E:105 Workshop Introduction to Elementary Science Study Program in Elementary Science 2-3 s.h.
Familiarization with the content, rationale, and methodology of elementary science study type of units. Teachers may select various units to construct a course to meet local needs.

7E:106 Introduction to Environmental Studies for K-12 Programs 2-3 s.h.
Introduction to materials and activities available for introducing environmental studies in the K-12 curriculum as a course sequence and model to supplement existing curricula. Same as 7S:106.

7E:107 Implementation of Environmental Studies for K-12 Programs I 2 s.h.
Consideration of seasonal activities in the area of environmental studies; associated with classroom implementation of activities in the area of environmental studies. Same as 7S:107.

7E:108 Implementation of Environmental Studies for K-12 Programs II 2 s.h.
Continuation of 7E:107/7S:107 for spring. Same as 7S:108.

7E:109 Workshop: Introduction to the Science: A Process Approach Program in Elementary Science 2 s.h.
Familiarization with the content, rationale and methodology of Science: A Process Approach (SAPA), an elementary science program initially developed by AAAS.

7E:110 Workshop: Introduction to the Science Curriculum Improvement Study Program in Elementary Science 2 s.h.
Focus is on activities which augment science concept development grades K-6; particular emphasis on organization, content and rationale of SCIS program.

7E:111 Workshop: Introduction to Unified Science and Mathematics for Elementary Schools Program in Elementary School 2 s.h.
Explores interdisciplinary units (minicourses) which have been developed to bring together content and processes which draw on science, mathematics, social science and language arts.

7E:119 Methods: Basic Skills and Techniques in Music Education 3 s.h.
Development of vocal and instrumental music skills (guitar, autoharp, recorder) for effective teaching of music to children. For music minors, elementary and secondary education majors, recreation majors, and other students, with consent of instructor.

7E:120 Methods and Materials: Music for the Classroom Teacher 3 s.h.
Development of music skills, techniques, and knowledge of methods and materials for teaching music to young children. For elementary education majors.

7E:121 Elementary School Physical Education 2-3 s.h.
Materials, methods, curriculum planning and improvement of performance skills, primarily for elementary education majors. Same as 28:149.

7E:122 Methods and Materials: Art for the Classroom Teacher 3 s.h.
Combination lecture and studio. Same as 1E:195.

7E:123 Children's Literature 3 s.h.
General overview of literature intended for children; discussion of children's interests, capabilities and reading programs; history and criticism of books for children; illustration of these books and recent trends in use of literature. Same as 21:123.

7E:126 Literature and Storytelling for Children 3 s.h.
Survey of children's books, old and new, appropriate for storytelling, storylistening, and sharing in general; strong emphasis on specific and practical techniques available for successfully communicating pleasure to children through books and related media. Prerequisite: 7E:123. Same as 21:126.

7E:127 Workshop: Introduction to Technology-People-Environment for K-12 Science Enrichment 2-3 s.h.
Introduction to materials and activities available to provide K-12 students with interdisciplinary and holistic approach to the study of current and future socio-technological problems and issues. Same as 7S:127.

7E:128 Implementation of Technology-People-Environment for K-12 Science Enrichment I 2 s.h.
Consideration of activities, materials, and implementation strategies which facilitate learning when the elementary or secondary student is unfamiliar with the content, disadvantaged, or unmotivated. Same as 7S:128.

7E:129 Implementation of Technology-People-Environment for K-12 Science Enrichment II 2 s.h.
Continuation of 7E:128/7S:128. Same as 7S:129.

7E:130 Workshop: Introduction to Developing Mathematical Processes in the Elementary School 2 s.h.
Introduction to activity approach to teaching mathematics K-6. Considerable attention will be given to developing mathematical manipulative interest-centers.

7E:131 Implementation of the Elementary Science Study Program in Elementary Science I 2 s.h.
Focus on classroom implementation of nonsequential science units; review of learning theory and classroom management skills as they relate to science instruction.

7E:132 Implementation of the Science: A Process Approach Program in Elementary Science I 2 s.h.
Consideration of SAPA implementation strategies; particular emphasis on individualizing instruction and associated classroom management procedures.

7E:133 Implementation of the Science Curriculum Improvement Study Program in Elementary Science I 2 s.h.
Focus on implementing SCIS materials; considerable attention to supplemental and enrichment science activities.

7E:134 Implementation of the Unified Science and Mathematics for Elementary Schools Program in Elementary School I 2 s.h.
Emphasis on implementing interdisciplinary units of

instruction; materials and classroom management stressed.

7E:135 Implementation of Developing Mathematical Processes in the Elementary School I 2 s.h.
Associated with classroom implementation of the DMP Program.

7E:137 School Physical Education Programs 2 s.h.
Same as 27:137 and 7S:137.

7E:138 Practicum: Environmental Education arr.
Designed to provide professionals in education and recreation with a basis for developing and implementing environmental education programs. Same as 104:143.

7E:139 Workshop: Children's Literature 3 s.h.
For preschool and elementary-level teachers, curriculum consultants, librarians, and principals who wish to expand and enrich their backgrounds in offering quality literature to children; emphasis on post-1970 publications for professionals and children; activities organized toward optimal utilization of literature, stressing media complement and practical educational application.

7E:140 Physical Education for the Elementary School 2-3 s.h.
Primarily for graduate students, classroom teachers and administrators; includes discussion of program development, modern methodology (including movement education), exceptional child, motor skill development, analysis of movement and evaluation procedures. Same as 27:159.

7E:143 Methods: Art 3 s.h.
Application of studio methods to teaching of children in Saturday Children's Art Class Program. Must be taken concurrently with 1E:198 Art Education Studio. Prerequisite: 1E:196.

7E:144 Methods and Materials: Elementary School Instrumental Music 2 s.h.
Materials, techniques, and methods for teaching band and orchestra instruments in the elementary school.

7E:145 Methods and Materials: Elementary School General Music 3 s.h.
For choral music majors and music minors seeking music teaching certification. Elective course for instrumental music majors. Prerequisite: 7E:119 for music minors.

7E:146 Implementation of the Elementary Science Study Program in Elementary Science II 2 s.h.
Continuation of 7E:131.

7E:147 Implementation of the Science: A Process Approach Program in Elementary Science II 2 s.h.
Continuation of 7E:132.

7E:148 Implementation of Science Curriculum Improvement Study Program in Elementary Science II 2 s.h.
Continuation of 7E:133.

7E:149 Implementation of the Unified Science and Mathematics for Elementary Schools Program in the Elementary School II 2 s.h.
Continuation of 7E:134.

7E:150 Implementation of Developing Mathematical Processes in the Elementary School II 2 s.h.
Continuation of 7E:135.

7E:151 Introduction to New Activities for Science Programs K-12 2- 3 s.h.
Introduction to integrate instructional materials from major curricular programs; recent curriculum research and development will be emphasized. Same as 7S:161.

7E:152 Implementation of New Activities for Science Programs K-12 I 2-3 s.h.
Emphasis on classroom implementation of new activities for an activity-based science classroom; supplemental and enrichment materials and activities. Same as 7S:162.

7E:153 Implementation of New Activities for Science Programs K-12 II 2 s.h.
Continuation of 7E:152/7S:162. Same as 7S:163.

7E:154 Human Science Program for Junior High School Science 2-3 s.h.
Introduction to materials, rationale and methodology of Human Science Program; related units developed locally and available from the Science Education Center will be explored. Same as 7S:164.

7E:155 Human Science Program for Junior High School Science I 2 s.h.
Classroom implementation of Human Science Program and related units will be emphasized; supplemental and enrichment materials and activities. Same as 7S:165.

7E:156 Human Science Program for Junior High School Science II 2 s.h.
Continuation of 7E:155, 7S:165. Same as 7S:166.

7E:157 Methods: Early Childhood Education I 3 s.h.
Acquaintance with current educational literature in all curricular areas; emphasis on application of educational theory and instructional materials in prekindergarten education. Open to junior and senior elementary education majors and graduate students.

7E:158 Supervised Teaching in an Early Childhood Center arr.
Supervised teaching in prekindergarten early childhood centers. Application must be made to the Office of Student Personnel, College of Education. Prerequisites: 7E:157, 7E:167, 17:10 or 7P:106.

7E:159 Early Childhood Education Special Projects 3 s.h.
For prekindergarten and primary teachers, supervisors, and consultants; emphasis on curriculum, methodology and materials; specific content varies with current issues, developments, needs of students.

7E:160 Methods: Elementary School Language Arts 3 s.h.
Emphasis on planning processes and development of problem method teaching units; approaches to personal self-discovery through creative dramatics and creative writing, and to language development, concepts concerning language, and skills of oral and written communication.

7E:161 Methods: Elementary School Social Studies 3 s.h.
Objectives and content for grades kindergarten through six; development of work study skills and problem method.

7E:162 Methods: Elementary School Science 2 s.h.
Principles and concepts of science instruction in elementary school for preservice instruction of elementary education majors; emphasis upon techniques which characterize new approaches to science. Prerequisites: 97:55- 56.

7E:163 Methods: Elementary School Mathematics 2 s.h.
Methods used in kindergarten and grades one through six; teaching number system and arithmetical operations meaningfully. Prerequisite: 22M:80.

7E:164 Methods: Elementary School Reading 3 s.h.
Basic methods, trends, recent materials and crucial issues in reading programs of kindergarten, primary and upper elementary grades.

7E:165 Methods: Multicultural-Bilingual Education 3 s.h.
Methods of instruction for multicultural and bilingual settings in grades K-6; emphasis on cognitive and affective areas of the teaching process, including curriculum and resource development and actual teaching strategies.

7E:167 Methods: Early Childhood Education II 3 s.h.
Acquaintance with current educational literature in all curricular areas; special emphasis on application of educational theory and on instructional materials for kindergarten, first and second grades.

7E:171 Reading Clinic: Teaching Techniques 2-3 s.h.
Diagnostic and remedial teaching techniques and differential reading curricula for children at all levels of reading ability and disability with specific emphasis on clinical teaching techniques particularly in the summer. Must be taken with 7E:172. Prerequisite: 7E:164 or 7P:170 or 7S:194.

7E:172 Reading Clinic: Teaching Practicum 2-3 s.h.
Practice in application of diagnostic teaching techniques and reading curriculum development. Must be taken with 7E:171. Prerequisite: 7E:164 or 7P:170 or 7S:194.

7E:173 Teaching Skill Learning in Elementary School Mathematics 2- 3 s.h.
Study of skills related to operations on set of whole numbers and rational numbers; emphasis on classroom learning of computational skills; examination of computational algorithms; diagnosis of pupil errors; developing effective teaching sequences; relationship of skill learning to appropriate mathematical concepts; related readings and research. Prerequisite: 7E:163.

7E:174 Teaching Geometry in Elementary School Mathematics 2-3 s.h.
Methods of teaching metric and nonmetric geometric concepts in grades K-8. Prerequisite: 7E:163.

7E:175 Elementary Language Arts Workshop 2-3 s.h.
Workshop for elementary teachers and language arts consultants and supervisors to examine a selected issue within elementary school language arts, such as creative self-exploration, linguistic applications, language development or curricula models; practical opportunity to design learning experiences and examine available programs and materials.

7E:176 Reading Workshop 3 s.h.
For elementary school teachers, reading teachers, reading specialists, and principals who wish to explore methods, materials, and instructional groupings which are currently being used to adapt reading instruction to individual differences; areas covered include learning stations, management systems, individualized reading, open classrooms, and programmed reading; specific practical ideas are examined and materials developed for implementation of individualization; attention also given to effects of individualization on the total learning experience of pupils.

7E:177 Workshop: Early Childhood Education 2-3 s.h.
Emphasis on exposure to most recent developments in curriculum materials and supporting theoretical background; application to these materials and development of new materials for specific instructional situations; includes direct observation of children. Enrollment by permission.

7E:178 Elementary School Mathematics Workshop 1-3 s.h.

7E:179 Workshop: Critical Reading and Thinking 2 s.h.
Emphasis on critical reading and thinking skills; use of literature in achieving goals of self-actualization and socialization; art of effective questioning and basic logic; recognition of propaganda techniques.

7E:180 Creative Drama in the Classroom 3 s.h.
Explores values of creative drama, familiarizes students with creative dramatics activities, develops ability to plan drama experiences, and provides guided experiences in leader techniques. For students in education, speech and dramatic art, recreation, etc.

7E:181 Piaget in the Classroom 3 s.h.
Designed primarily for experience teachers; explores the development of logical thought in the concrete- and formal-operational stages. Major emphasis is upon learning numerous Piaget-type tasks, presenting these tasks to children, deriving classroom implications from the data.

7E:182 General Music Workshop 1 s.h.

7E:183 Supervision of Science in the Elementary School 3 s.h.
Objectives, selection and grade placements of content, classroom procedures and evaluation of results; teaching aids such as books, demonstration equipment, visual aids, field trips.

7E:184 Workshop: Piaget for Teachers 3 s.h.
For teachers interested in examining and possibly implementing some of the work of Jean Piaget in their classrooms; specific classroom procedures along with determination of appropriate content topics for various grade levels; classroom activities devised from group-generated ideas, drawn from critiques and revisions of existing curriculum materials.

7E:185 Art Education Workshop 2-3 s.h.
Curriculum content for elementary school art; emphasis on recent procedures, new methods and materials; includes studio practice, field trips, demonstrations, observations. Same as 7S:185.

7E:186 Curriculum Foundations 2-3 s.h.
Elementary and secondary background developments in curriculum; definitions, historical perspective, philosophies, theories of knowledge, models, learning theories, directions of development and shaping forces; product oriented. Same as 7S:186.

7E:187 Workshop Classroom Observation Techniques: Applications and Analyses 3 s.h.
Application of systematic observation techniques to interpersonal communications skills characteristic of classroom teaching and school counseling; focus on ways to assess various dimensions of the interactions occurring in school situations and procedures to analyze information obtained in these settings.

7E:191 Supervised Teaching in Elementary School arr.
Prerequisite: application must be made to the Office of Student Personnel, College of Education.

7E:192 Laboratory Practice in Elementary School arr.
Supervised teaching and observation in special areas of elementary curriculum. Prerequisite: consent of instructor.

7E:195 Multicultural Concepts and Educational Systems 3 s.h.
In-depth examination of educational practices within various communities, both international and local; educational perceptions of these multicultural communities; perceptions of the educational institutions which serve them.

7E:197 Aesthetic Education 2 s.h.
Introductory course designed to acquaint art education students (and other interested education students) with aesthetic model for education; study role arts serve within framework of general classroom related to other subject matter. Same as 7S:197.

7E:204 Analysis and Selection of Children's Literature to Develop Educational Environments 3 s.h.
Theory, criteria and appropriate methodologies for literature programs in a variety of instructional settings; in-depth analysis, research techniques and multi-media approaches to learning. Prerequisite: 7E:123.

7E:206 General Music Programs in the Public Schools 3 s.h.
Curriculum development, instructional materials, and analyses of current teaching methods and techniques in general music instruction in the public schools. Same as 7S:206.

7E:214 Group Care Services for Children: The Need for Standards and Licensing 3 s.h.
Interdisciplinary seminar to examine historical, legal, and protective considerations in standards for out-of-home care, including health, safety, nutrition, development, and educational needs of children. Same as 42:214, 96:214; 17:214.

7E:215 Interdisciplinary Approaches to Serving Vulnerable Children and Their Families 3-4 s.h.
Interdisciplinary seminar focusing on identification of at-risk groups in the population and on prevention, assessment, and management of selected situations and developmental crises predicted to interfere with children's development. Permission of instructor required. Same as 42:215, 17:215, 96:215.

7E:234 Advanced Practicum in Pre-School Education arr.
Directed observation and participation at the Early Childhood Education Center.

7E:237 Public School Curriculum in Physical Education 3 s.h.
Same as 27:237, 7S:345.

7E:238 Teaching the Low Achiever in Mathematics 2-3 s.h.
Implementing programs for improving both attitude and mathematical proficiency of low achievers in mathematics. Same as 7S:238.

7E:242 Supervision of Physical Education 3 s.h.
Same as 27:242, 7S:242.

7E:243 Supervision and Curriculum Development in Art Education 2-3 s.h.
Problems and responsibilities of art supervisor including curriculum, facilities, financing, supervision, inservice training and reporting; study of factors influencing art curriculum decisions; curriculum analysis, selection, organization, preparation and evaluation. Same as 7S:243, 1E:243.

7E:246 Problems of Experimental Design in Science Education 2 s.h.
Special research projects; school situations utilized as experimental design considered, pilot studies conducted and techniques of research at this level practiced; for graduate students interested in evaluation techniques. Required of all beginning graduate students who have little or no previous experience with research.

7E:250 Program and Research Problems in Science Education 2 s.h.
Same as 7S:250.

7E:260 Supervision of Elementary School Language Arts 3 s.h.
Explores curricular models, curriculum development processes, methodology and materials for an elementary school language arts program; focuses on personal self-discovery through creative dramatics and writing, developing understandings concerning language, language development processes, effective oral and written communication. For experienced teachers, curriculum personnel, and those specializing in language arts.

7E:261 Supervision of Elementary School Social Studies 3 s.h.
Curriculum content used for consideration of modern classroom procedures; cooperative problem assignment, provision for individual differences and functional development of study skills.

7E:262 Advanced Techniques of Teaching Science in the Elementary School 3 s.h.
Theories of teaching science at elementary school level; emphasis upon procedures which enable implementation of modern philosophies characterizing elementary school science education; primarily for experienced elementary teachers progressing toward graduate degrees; graduate students in science education may also find consideration of these concepts of value.

7E:263 Supervision of Elementary School Mathematics 2-3 s.h.
Methods of instruction, nature of arithmetical processes, number system, testing, use of proof, drill, research, selection and gradation of arithmetical content.

7E:264 Building Foundations for Reading: Pre-primary and Primary 2-3 s.h.
Understanding of early reading experiences; relationship of reading to other communication areas; knowledge of instructional approaches, techniques, currently used materials and assessment procedures; organizational patterns for instruction; interrelationship of home and school experiences; identification of current and crucial issues; knowledge of pertinent research.

7E:265 Supervision of Intermediate Grade Reading 3 s.h.
For teachers, principals and supervisors; reading with comprehension, provision for individual differences, research in reading, extension of skills taught in primary grades.

7E:267 Improvement of Instruction in Primary Education 2-3 s.h.
Crucial and current problems in selection and organization of curriculum and in methods of teaching to promote learning; involves both theory and practice.

7E:268 Supervision and Curriculum Development in Preprimary Education 3 s.h.
Major issues in the selection and organization of preprimary instructional programs; recent curriculum research and development.

7E:280 Supervision of Student Teachers 2-3 s.h.
For teachers, supervisors and principals; analysis of techniques and strategies for supervising student teachers; review of techniques for utilizing volunteer and paid teacher aides.

7E:282 Use of the Inquiry Method in the Elementary Grades 3 s.h.
Focus on development of techniques and materials utilized in the inquiry approach; review of learning theory and classroom management skills as they relate to the inquiry method; considerable attention to mastery of specific teaching techniques needed to translate the theory into practice. Designed for in-service teachers.

7E:293 Individual Instruction in Early Childhood and Elementary Education arr.
Prerequisite: consent of instructor.

7E:300 Design and Organization of Curriculum for Early Childhood, Elementary, and Middle Schools
Major issues, modern selection, sequential arrangement and organization of content; relationship of time allotments to implementation; utilization of instructional equipment; appraisal procedures; staff participation in curriculum development; basic requirement in supervision and administration programs.

7E:301 Seminar: History and Theory of Early Childhood Education 3 s.h.
Analysis of historical and theoretical development of early childhood education programs; readings and class discussions.

7E:302 The Science Curriculum in the Elementary School 2-3 s.h.
Analysis of major science series and curricular materials;

rationale, history and reports of evaluative studies for each program considered; sample programs experienced by observation, demonstration and use in classroom. For graduate students interested in supervision, administration or college teaching.

7E:304 Seminar: Elementary Education 2 s.h.
Consideration of major problems, research findings, and current developments in elementary school instructional programs. Prerequisite: consent of instructor.

7E:306 Introduction to Research in Art Education 3 s.h.
Methods of inquiry used for research in art education and related disciplines; methods of research design. Required of all Ph.D. candidates in art education. Same as 7S:306.

7E:307 Seminar: Aesthetic Education 2-3 s.h.
Theories of aesthetics as they relate to teaching; instructional and learning models; nature of aesthetic experience in visual arts and related arts; aesthetic model as it relates to other disciplines in education; review of aesthetic education programs. Same as 7S:307.

7E:323 Seminar: Teaching Children's Literature arr.
Development of curriculum content for college courses in children's literature; construction of course in literature required; emphasis placed on development of adequate background for teaching; supervised experience arranged. Prerequisites: 7E:123 and consent of instructor.

7E:335 Seminar: Mathematics Education arr.
Prerequisite: consent of instructor. Same as 7S:335.

7E:336 Problems in Mathematics Education arr.
Review of research in teaching of mathematics, K-12, including examination of teaching of algebra and geometry, grade placement of content and methodology.

7E:360 Seminar: Elementary School Language Arts arr.
For advanced students in elementary education who have taken systematic course (e.g., 7E:260); opportunity to do further intensive study on specific topics. Prerequisite: consent of instructor.

7E:362 Current Readings in Science Education 2 s.h.
Trends and modern research; advanced investigation; original research reports read, analyzed and discussed; emphasis on learning theory. Primarily for advanced graduate students.

7E:364 Seminar: Elementary Reading 2-3 s.h.
For advanced students in elementary education who have taken systematic course (e.g., 7E:264 or 7E:265); opportunity to do further intensive study on specific topics. Prerequisite: consent of instructor.

7E:365 Reading Clinic: Supervision arr.
Prerequisite: consent of instructor.

7E:366 Administering and Supervising K-12 Science Programs 2 s.h.
Roles and functions of coordinators and chairs in science instructional programs. Same as 7S:254.

7E:367 Seminar: Current Issues in Art Education 2-3 s.h.
Study and analysis of fundamental concepts derived from art education and related disciplines; examination of literature in art education. Required of all M.A. and Ph.D. candidates in art education. May be repeated for credit. Same as 7S:367.

7E:384 Laboratory Practice in Supervision arr.
Individually planned practicum experiences in a variety of supervisory roles. Prerequisite: consent of instructor.

7E:385 Practicum in College Teaching arr.
Prerequisite: consent of instructor.

7E:391 Special Problems in Science Education 2-4 s.h.
Individual research projects which may evolve into theses for advanced students; means of gaining assistance with special investigations for advanced students. Prerequisite: consent of instructor.

7E:392 Field Service Project in Early Childhood and Elementary Education arr.
Prerequisite: consent of instructor.

7E:393 M.A. Thesis in Early Childhood and Elementary Education arr.
Prerequisite: consent of instructor.

7E:395 Educational Specialist Research in Early Childhood and Elementary Education arr.
Prerequisite: consent of instructor.

7E:405 Seminar: Child Art and Art Education 2-3 s.h.
Analysis and evaluation of current concepts of child art and child development, perception, creativity and art education; historical development of theories of child art, child development and art education. Same as 7S:405.

7E:406 Research in Art Education arr.
Individual research under supervision; applicable to thesis preparation and to doctoral prospectl development. May be repeated for credit.

7E:493 Ph.D. Thesis in Early Childhood and Elementary Education arr.
Prerequisite: consent of instructor.

Educational Psychology, Measurement and Statistics

Chair: Leonard S. Feldt
Faculty: *professors* Gordon N. Cantor, William E. Coffman, Leonard S. Feldt, Robert Forsyth, A. N. Hieronymus, Devore E. Kilip, Siegmar Muehl, Melvin R. Novick, Lowell Schoer, Bill C. F. Snider
associate professors Bobby R. Brown, Margaret M. Clifford, Jerry L. Gray, Joyce E. Hood, H.D. Hoover, Earl J. Maxey
assistant professors Richard Ferguson, Patricia M. King, Calvin R. Stevenson
instructor Elizabeth Forell
Degrees offered: Educational Psychology—M.A., Ph.D.; Measurement and Statistics—M.A., Ph.D.; Reading Disability—M.A.

M.A. in Educational Psychology

This program may be taken with thesis (30 s.h. minimum) or without (32 s.h. minimum). It is intended to provide a broad overview of educational psychology.

Prior teaching experience is highly desirable but is not required for admission to the program.

Only one course, 7P:143 Introduction to Statistical Methods, is specifically required of all candidates, but each candidate must elect at least one course in each of these areas: teaching and learning, developmental processes, measurement and research, and social foundations.

Candidates must develop concentrations in at least two fields, chosen from the four areas designated above, plus measurement, statistics, and reading disabilities.

Candidates normally write comprehensive examinations covering their chosen fields of concentration. Alternative, individually structured procedures may be developed by the student's adviser in consultation with the student and the other members of the student's committee.

M.A. in Educational Measurement and Statistics

This degree program also may be taken with thesis (30 s.h. minimum) or without (32 s.h. minimum). It is intended to provide minimal training for the student seeking to qualify for a position which calls for special competence in educational measurement and research methodology. Such positions are typically found in larger school systems, state departments of instruction, test publishing organizations, or research centers.

Admission requirements are the same as those established by the Graduate College, except that if the candidate's GRE total score is less than 1000, and no offsetting evidence of superior ability is available, the admission may be conditional. A background in college mathematics and experience as a teacher or researcher are highly desirable but not required for admission to the program.

All students are required to complete a common core of courses totaling 18-20 semester hours. Courses comprising this core include a graduate-level survey-type course in educational psychology, an intermediate course in classical statistical methods, a course in Bayesian statistical methods, a course in educational research methodology, a course in test construction, and a course in educational measurement and evaluation.

Elective courses (12-14 s.h. minimum) must include at least one course offered by the divisions of Elementary, Higher, or Postsecondary and Continuing Education. Recommended areas from which other electives may be chosen include educational psychology, statistical methods, educational measurement, computer programming and data processing, mathematical statistics, counseling and guidance, special education, and mathematics.

In the final semester, candidates must write two three-hour or three two-hour comprehensive examinations. These examinations must include the fields of educational measurement and applied statistics. The third examination, if any, will cover educational psychology or an alternative area approved by the adviser.

M.A. in Reading Disability

Only a nonthesis (32 s.h. minimum) program is available in reading disability. The purpose of the program is to provide training in the diagnostic teaching of reading. Satisfactory completion of the program leads to endorsement (certification) as a reading clinician. Graduates may return to classroom teaching or serve as reading clinicians, resource teachers, or consultants.

In addition to admission requirements of the Graduate College, applicants for admission to the M.A. program in reading disability must have had two years of successful teaching experience.

The program requires completion of a common core of courses totaling 16 semester hours. Courses included in this core are:

7P:170 Introduction to Psychology of Reading	3-4 s.h.
7P:273 Reading Clinic: Diagnosis	2- 3 s.h.
7P:150 Educational Measurement for the Classroom Teacher	2- 3 s.h.
7U:251 Individual Intelligence Testing	3-4 s.h.

In addition, each candidate must complete at least five semester hours of practicum-type courses chosen from an approved combination of:

7E:171 Reading Clinic: Teaching Techniques	2 s.h.
7E:172 Reading Clinic: Teaching Practicum	2-3 s.h.
7E:365 Reading Clinic: Supervision	arr.
8P:370 Teaching in a Reading Laboratory	3 s.h.

Elective courses (11 s.h. minimum) may be chosen from such fields as speech pathology and audiology, elementary and/or secondary school literature and language arts, educational psychology, and elementary and/or secondary school curriculum.

All students are required either to write a three-hour comprehensive examination in reading disability and two 90-minute comprehensive examinations in related fields, or to complete a project in lieu of one or more of the written examinations. The project will involve the investigation of a problem comparable to those encountered by a reading clinician or consultant in the field.

Ph.D. in Educational Psychology

The purpose of this program is to provide training which will qualify graduates to teach educational psychology and to conduct research in this field.

Admission requirements are the same as those established by the Graduate College, except that if the candidate's GRE total score is less than 1000 or if other evidence (GPA, academic preparation, and/or experience) warrants it, admission will be conditional. In such cases, the student must achieve regular status within two sessions of registration (16-20 semester hours total) to continue in the program.

Teaching experience is highly desirable but not required for admission.

Qualified candidates who do not hold M.A. degrees will be admitted to the M.A. program (with thesis) and must earn that degree prior to formal acceptance into the Ph.D. program.

A minimum of 72 s.h. is required for the Ph.D. degree but the typical student finds it necessary to earn 90 or more semester hours of credit to satisfy the degree requirements.

If a candidate is admitted to the Ph.D. program on the basis of an M.A. degree without thesis, the candidate must complete a project comparable in scope to a master's thesis. The project must be completed before the writing of Ph.D. comprehensive examinations.

Specific minimal course requirements include 17 s.h. of statistics and research methodology, including at least one course in educational or psychological measurement, and three courses (9 s.h.) from the general areas of teaching and learning and developmental processes, with at least one course from each area.

The written comprehensive examinations, normally totaling nine hours, are chosen from two or more of these areas: general educational psychology, human development, learning-motivation, and instructional design.

In lieu of a written examination in one of these areas, the student may be assigned a project approved in advance by his committee and the dean of the College. This project will involve the comprehensive use of analytical, evaluative skills or research creativity. It will demand a command of skills equivalent in sophistication to those demonstrated on a written examination.

Ten or more semester hours of credit may be earned in the form of dissertation credit. The final requirement consists of an oral defense of the completed dissertation.

Ph.D. in Educational Measurement and/or Statistics

The purpose of this program is to prepare students for high-level professional positions in educational measurement, evaluation, and statistical methods. Such positions are frequently found in colleges and universities, state departments of instruction, public and private school systems, test publishing firms, and research or evaluation centers.

Admission requirements are the same as those established by the Graduate College except that where the candidate's GRE total score is below 1000 and no offsetting evidence of superior ability is available, admission may be on a conditional basis. In such cases, the student must achieve regular status within two sessions (16-20 semester hours total) of registration to continue in the program.

Students expecting to concentrate in statistics should have training in college mathematics through multivariate differential and integral calculus; the calculus requirement may be met during the first year of residence study. At least one year of professional experience in teaching, research, or related fields is highly desirable. Qualified candidates who do not hold M.A. degrees will be admitted to the M.A. program (with thesis) and must earn that degree prior to formal acceptance into the Ph.D. program.

The program requires a minimum of 90 s.h. In addition to the common core courses listed for the M.A. degree, typical programs include advanced work in educational measurement and scaling of measures, classical and Bayesian methods of data analysis, research methodology and the planning of experiments, educational psychology; and the Ph.D. thesis (12 or more s.h.). Candidates who enter the

program on the basis of an M.A. degree without thesis will be required to complete a project comparable in scope to a master's thesis. The project must be completed before the writing of the Ph.D. comprehensive examinations.

Students who concentrate in the area of statistics, with the intention of teaching on the college level, will be advised to take considerable coursework in mathematical statistics. Those who concentrate in the area of educational measurement and evaluation are advised to take appropriate courses in curriculum, guidance, or postsecondary and continuing education. All students are expected to develop familiarity with computer programming techniques and equipment. Work in other departments of the University is encouraged.

The student normally takes three-hour written comprehensive examinations over the fields of statistics, educational measurement, and educational psychology, or an approved substitute area. In lieu of one of the examinations, the student may be assigned a project requiring skills equivalent to those required by the examination. The written examinations are followed by an oral examination.

The dissertation topic is chosen from the fields of educational measurement, evaluation, or statistical methods.

Ph.D. in Educational Psychology with Concentration in Reading Disability

Students are expected to meet the admission and degree requirements of the Educational Psychology Ph.D. degree program, except that one of the written comprehensive examinations must be in the area of reading disability, and the dissertation topic must be chosen from this area.

In addition to pertinent courses offered by the divisions of Special, Early Childhood and Elementary, and Secondary Education, the elective portion of the student's course program will include relevant courses offered by the Department of Speech Pathology and Audiology, the Department of Linguistics, and courses selected from the developmental psychology program of the Department of Psychology.

Financial Aids

The Division normally employs two graduate students as teaching assistants in educational psychology and two in educational statistics. These are half-time academic year appointments and holders are permitted to carry a study and/or research load of up to 12 s.h. per semester. These positions are generally awarded to experienced advanced doctoral students in either educational psychology or educational measurement and statistics. Possible candidates may address inquiries to the chair of the Division.

Other types of graduate assistantships are supported by the Iowa Tests of Basic Skills and the Iowa Tests of Educational Development. Duties are varied, including such responsibilities as test development, test norming, and consulting with teachers in the field whose pupils have participated in these testing programs. There are also a few other assistantships supported by the Iowa Testing Programs which are not specific to the two programs cited above. Inquiries should be directed to the program directors.

Courses

7P:75 Educational Psychology and Measurement 3 s.h.
Factors in mental development and classroom learning; child and adolescent characteristics; problems in classroom management; construction, use, interpretation and evaluation of educational tests. Same as 31:17.

7P:102 Learner Characteristics 3 s.h.
Overview of individual differences found to have direct implications for teaching.

7P:106 Child Development 3 s.h.
Developmental norms; maturation-learning, nature-nurture controversies; learning and motivational processes; cognitive and social development; effects of early experience. Same as 31:111.

7P:108 Personality and Mental Hygiene 3 s.h.
Personality and adjustment of normal child; antecedents and causes of typical behavior patterns; principles for modifying behavior; prevention of adjustment disorders.

7P:109 Socialization of the School-Age Child 2-3 s.h.
Social development, preschool influences, development of attitudes and interests, effects of social class on social development.

7P:111 Understanding and Controlling Human Motivation 1 s.h.
Factors influencing motivational states and behaviors, including personal characteristics, thought patterns, success and failure, reward and punishment, attitudes, needs, and goals; controlling one's own or another's motivation; relationship between motivation and behavior in learning and social situations. Five-week course.

7P:112 Guiding the Social Development of Children 1 s.h.
Factors influencing social behavior of children; importance of models and "heroes"; effects of competitive and cooperative activities; use of reward, punishment, disciplining techniques; peer pressure; nature of children's moral judgments and acts; prevention and elimination of socially deviant behaviors. Five-week course.

7P:113 Stimulating the Intellectual Growth of Children 1 s.h.
Environmental factors and activities facilitating intellectual growth of infants and children; role of parents, teachers, siblings, and peers; games, toys, household tasks, visual and auditory materials, and conversation as contributors to growth of verbal and quantitative abilities. Five-week course.

7P:118 The Educational Romantics: School Reformers of the 1960s 1-2 s.h.
School-reform writers of the 1960s: their psychological and philosophical assumptions and impact on schools of 1960s and '70s: writings of Goodman, Holt, Illich, and others; appropriate for non-Education and Education majors. Eight-week course. Same as 7F:118.

7P:131 Educational Psychology 3-4 s.h.
Psychology in teaching and learning; developmental concepts, social processes, language and thought, personality and mental health, models of teaching and research, theory and applications of learning process. Same as 31:115.

7P:133 The Adolescent and Young Adult 3 s.h.
Readings and discussion relating physical, psychological and cultural factors to behavior and attitudes; content drawn from psychological literature, fiction, current media and personal experience.

7P:143 Introduction to Statistical Methods 3 s.h.
Analysis and interpretation of research data; descriptive statistics (frequency distributions, central tendency, variability); introduction to statistical inference (normalcurve sampling theory, simple t-test); introduction to correlation and linear regression. Same as 22S:102, 31:143.

7P:148 Bayesian Statistics I 3 s.h.
Conditional probability, Bayes's theorem, analysis of posterior densities, beta-binomial analysis, normal models, comparison of means and variances, simple correlation and regression; case studies. Prerequisite: 7P:143 or equivalent. Same as 22S:138.

7P:150 Educational Measurement for the Classroom Teacher 2-3 s.h.
Discussion of the process of measuring pupil achievement; selection of appropriate objectives to be measured, construction of valid instruments, administration and scoring, interpretation of test performance and posttest analysis of item quality; survey of standardized achievement and aptitude tests; interpretation and uses of standardized test results and suggestions for using test results to improve teaching and learning. No prior background in statistics required.

7P:170 Introduction to Psychology of Reading 3 s.h.
Psychological and linguistic analysis of reading process; implications for teaching methods and materials; factors related to reading performance.

7P:181 Introduction to Theories of Learning 3 s.h.
Role of learning theories in psychology and education; types of theories; overview of theories, past and present, as they relate to teaching.

7P:183 Cognitive Development in Children: An Introduction to Piaget 3 s.h.
Introduction to Piagetian theory of cognitive development with emphasis on core concepts and Piaget's stage analyses.

7P:193 Special Readings and Projects arr.
Supervised individual study. Prerequisites: senior standing and consent of instructor.

7P:202 Individual Differences and Teaching 3 s.h.
Study of relationship between individual differences and task variables and their implications for instruction.

7P:206 Advanced Child Development 3 s.h.
Systematic examination of psychoanalytic, Piagetian and S-R theory as applied to psychological development of the child; review of selected research studies from the recent and current literature in child development. Prerequisite: 7P:106 or equivalent.

7P:215 Personality Development in Adolescent and Adult 2-3 s.h.
Review of theories and related research of personality development from adolescence to adulthood, including such areas as moral, cognitive, and ego development; applications in educational settings.

7P:231 Adult Teaching and Learning 2-3 s.h.
For individuals whose interests and professional responsibilities involve teaching older students; readings in literature on teaching and learning; discussion; individual application.

7P:240 Bayesian Statistics II 3 s.h.
Simultaneous estimation of means, variances and proportions, statistical decision theory with educational applications; multiple regression and correlation; case studies. Prerequisite: 7P:148 or consent of instructor. Same as 22S:239.

7P:242 Selected Applications of Statistical Techniques 3 s.h.
For students planning to take only one course in statistical methods beyond scope of single elementary course; not equivalent to 7P:243; application and interpretation of correlation techniques, chi-square, the t- and F-tests, interval estimation and simple cases of analysis of variance. Prerequisite: 7P:143 or equivalent.

7P:243 Intermediate Statistical Methods 4 s.h.
Logic of statistical inference, chi-square and other tests of statistical hypotheses, small sample error theory, interval estimates, introduction to analysis of variance and selected nonparametric methods. Prerequisite: 7P:143 or equivalent. Same as 22S:148.

7P:244 Correlation Methods 3 s.h.
Regression analysis and correlation techniques; multiple, partial, curvilinear, biserial and tetrachoric correlation; discriminant analysis; correlation ratio; sampling theory applied to regression analysis and correlation. Prerequisite: 7P:243 or equivalent. Same as 22S:157, 31:244.

7P:245 Applications of Multivariate Statistical Techniques 3-4 s.h.
Techniques include multivariate analyses of variance, discriminant analysis, and factor analysis. Prerequisite: 7P:244 or equivalent. Same as 22S:161.

7P:246 Design of Experiments 4 s.h.
Theory and methods in planning and statistical analysis of experimental studies; testing of hypotheses about linear contrasts among means in single-factor and multifactor, completely randomized and repeated measurement designs. Prerequisite: 7P:243 or equivalent. Same as 22S:159.

7P:247 Distribution-Free Statistical Methods 2-3 s.h.
Theory and development of selected nonparametric techniques; includes measures of association and analysis of variance; special emphasis on relationship with classical parametric procedures. Prerequisites: 7P:243 and consent of instructor. Same as 22S:163.

7P:248 Data Processing 3 s.h.
Computer data processing with special emphasis on Fortran language used by computer at University Computer Center; use of Computer Center statistical library; preparation of data to be submitted to computer; use of computer in effecting statistical analyses of thesis and research data. Prerequisites: 7P:143 or equivalent, and consent of instructor.

7P:249 Quantitative Foundations for Applied Statistics 3 s.h.
Mathematical foundations of general linear models (regression analysis, univariate and multivariate ANOVA, multiple and canonical correlations, etc.), test theory, factor analysis and scaling methods; primary emphasis on demonstrating the uses of matrix algebra in applied statistics. Prerequisite: 7P:243 or equivalent, or consent of instructor.

7P:255 Construction and Use of Classroom Evaluation Instruments 3 s.h.
Purposes of measurement, characteristics of good evaluation instruments, development of instruments to measure both cognitive and affective goals, evaluation of instruments, interpretation and use of results. Prerequisites: 7P:143 and consent of instructor.

7P:257 Educational Measurement and Evaluation 3 s.h.
Tests, rating scales, questionnaires, and other standardized instruments as sources of educational data; evaluation of the reliability and validity of data-gathering techniques; interpretation of scores in individual guidance and program evaluation. Sources of test information and criticism. Prerequisite: 7P:143 or equivalent.

7P:258 Theory and Technique in Educational Measurement 3 s.h.
Mathematical theories underlying educational and psychological measurements; philosophical issues in achievement test construction, estimation of test reliability and validity, derivation of norms, scaling and equating test batteries. Prerequisites: 7P:243 and 7P:257 or equivalent and consent of instructor.

7P:259 Scaling Methods 3 s.h.
Unidimensional and multidimensional scaling techniques; emphasis on educational and psychological applications; an introduction to available computer scaling programs is included. Prerequisite: 7P:243 or equivalent. 7P:249 recommended.

7P:270 Advanced Psychology of Reading 3-4 s.h.
Theories and models of the reading process and its development; review of selected research studies from the recent and current literature. Prerequisite: 7P:170 or consent of instructor.

7P:273 Reading Clinic: Diagnosis 2-3 s.h.
Evaluation of diagnostic tests of reading ability; clinical practice in diagnosis; interpretation of test results. Prerequisites: 7P:150, 7E:171, and 7E:172.

7P:280 Educational Research Methodology 3 s.h.
Procedures for planning, conducting and reporting research; evaluation of current methods in educational research. Prerequisite or corequisite: 7P:143.

7P:281 Advanced Theories of Learning 3 s.h.
Systematic and in-depth study of a limited number of contemporary theories of learning as they relate to education.

7P:282 Cognitive Processes in Classroom Learning 3 s.h.
Theories of cognitive development; concept formation, problem solving, styles and strategies of thinking; application of cognitive theory to classroom learning.

7P:285 Motivation in Education 3 s.h.
Theories of motivation; application to education; evaluation of current research trends.

7P:293 Individual Instruction in Educational Psychology, Measurement or Statistics arr.
Prerequisite: consent of instructor.

7P:331 Seminar: Educational Psychology I: Research and Teaching arr.
Profession of educational psychology; current instructional materials; critical evaluation of research in educational psychology. Prerequisite: consent of instructor.

7P:332 Seminar: Educational Psychology II: Psychology of Learning arr.
Psychology of learning as related to classroom practice and curriculum organization. Prerequisite: consent of instructor.

7P:333 Seminar: Educational Psychology III: Social Psychology of Education arr.
Educational aims and societal values; school as social system; individuals and subcultures; nature and dynamics of instructional group. Prerequisite: consent of instructor.

7P:334 Seminar: Educational Psychology IV: Motivation arr.
Motivation theory and research applicable to educational settings. Prerequisite: consent of instructor.

7P:336 Seminar: Educational Psychology VI: Advanced Topics in Child Development arr.
Two-part focus on aspects of children's cognitive development and racial attitudes. Student may enroll for either half (one s.h.) or both (two s.h.). Project earns additional 1 s.h. Prerequisite: consent of instructor.

7P:337 Seminar: Educational Psychology VII: Advanced Readings in Educational Psychology arr.
Review and evaluation of recent literature in educational psychology. Prerequisite: consent of instructor.

7P:343 Seminar: Statistical Analysis arr.
Prerequisite: consent of instructor.

7P:346 Seminar: Educational Research Methodology arr.
Prerequisite: consent of instructor.

7P:347 Seminar: Bayesian Methods arr.
Advanced research seminar on the application of Bayesian methods to educational problems. Intended particularly for students working on or seeking to develop research topics in this area. Students may register more than once for a total of up to six s.h.

7P:355 Seminar: Educational Measurement and Evaluation arr.
Critical examination of current issues and problems of the professional worker in the field of educational measurement and evaluation as reflected in the research literature and other professional communication media.

7P:371 Seminar: Experimental Approaches to Psychology of Reading arr.
Experimental investigations of reading process; emphasis on discrimination, association and language variables; analysis of theory, experimental methods, research findings and problem areas. Prerequisite: consent of instructor.

7P:380 Practicum in College Teaching arr.
Provides qualified graduate students with supervised college teaching experience in courses related to major academic areas; student, in collaboration with faculty instructor teaching such courses, is given opportunities to observe and critique staff teaching, to plan and teach short-term units, to participate in small group discussion and in planning course objectives, evaluation procedures, etc. Prerequisite: consent of instructor.

7P:393 M.A. Thesis in Educational Psychology, Measurement or Statistics arr.
Prerequisite: consent of instructor.

7P:493 Ph.D. Thesis in Educational Psychology, Measurement or Statistics arr.
Prerequisite: consent of instructor.

Instructional Design and Technology

Chair: Lowell A. Schoer
Faculty: *professors* Lowell A. Schoer, Lawrence M. Stolurow
associate professors Bobby R. Brown, Lida C. Cochran, William B. Oglesby
assistant professors Barry D. Bratton, John E. Hurn, Paul Kerber, Marvin Lavin, Mildred Lavin, Henrietta L. Logan
lecturer Calvin E. Mether, Barbara Poston
Degrees offered: M.A., Ed.S., Ph.D.

Undergraduate Program

The Division does not offer an undergraduate degree. There are, however, a number of courses open to undergraduate students.

Graduate Programs

The general goal of the graduate program in Instructional Design and Technology is to help students acquire and engage in research and development extending knowledge related to the systematic development of instruction. This includes knowledge about how students learn, and the full range of methods and materials by which such learning can be facilitated. Because such a goal requires that the student be given a broad perspective, the program is strongly interdisciplinary. Available areas of specialization are administration, computer applications, evaluation, instructional development, instructional psychology, media production, visual studies, and health sciences education. Programs can be planned in such a way as to lead to the media specialist endorsement to a teaching certificate (endorsement 39).

M.A. Program

Minimum total semester hours required: 35 s.h.

Purpose: To provide a basic background in instructional design and technology for classroom teachers or for those who plan careers as instructional designers and technologists in education, business or industry. May be taken with or without thesis.

Admission: A minimum GPA of 2.50 on all previous coursework and a composite GRE (Quantitative plus Verbal) of at least 1000 are required for regular admission. Students with GRE composites of less than 1000 and/or grade-point averages below 2.50 may be admitted conditionally. Teaching or relevant work experience may be helpful.

Ed.S. Program

Minimum total semester hours required: 60 s.h.

Purpose: To provide specialized training in instructional design and technology beyond that attained in the M.A. program.

Admission: Same as for M.A., except that a minimum GPA of 3.00 on all previous graduate work is required for regular admission.

Ph.D. Program

Minimum total semester hours required: 90 s.h.

Purpose: To provide a broad background for students interested in teaching, research, and leadership positions in instructional design and technology. There is a relatively heavy emphasis in this program on helping the student acquire the knowledge and skills necessary to expand our understanding of learning and instruction and those factors which influence them.

Admission: Same as for Ed.S., except that a minimum grade-point average of 3.20 on all previous graduate work is required for regular admission.

Courses

7W:91 Audiovisual Equipment for Instruction 1 s.h.
Introduction to the operation of audiovisual equipment most frequently available to the classroom teacher; included are still and motion picture projectors, audio and video tape recorders, duplicating and copying machines, dry mount press and lettering devices.

7W:103 Selection and Use of Media for Instruction 2 s.h.
Overview of educational media and their application in the classroom with particular emphasis on the selection and evaluation of media appropriate for given instructional objectives; among media discussed are still and motion pictures, audio- and videotape, graphic display, and computers.

7W:105 Design and Production of Media for Instruction arr.
Techniques related to the design and production of flat pictures, transparencies, slides and filmstrips, audio and video tapes, motion pictures, and other media which can be used in instruction.

7W:108 Communication Through Visuals 2-3 s.h.
Basic theory and practice for planning, creating, and using simple visual material in small or large group presentations. For educators, journalists, administrators, or other professionals who will be responsible for preparing reports, publications, advertising, displays, and related communications. No art experience required.

7W:109 Communications and Media Message Design 3 s.h.
Effect of selected media on shape, control, and reception of messages; media characteristics; media selection; and communication strategies. Includes practice in media selection and message construction. Same as 36B:109.

7W:115 Workshop in Instructional Design and Technology arr.

7W:120 Introduction to Instructional Design and Technology 3 s.h.
Professional roles, responsibilities, problems, and goals. Prerequisite: 7W:103 or consent of instructor.

7W:121 Designing Learning Programs for Health Sciences Education 3 s.h.
Designed to provide information/discussion on such topics as the systems approach to instructional design, writing educational objectives, construction of self-instructional learning packets, developing clinical evaluation tools, writing objective examinations, and affective evaluation; students are expected to do outside readings, participate in class activities, and write a self-instructional package for use in their teaching activities. Same as 50:161, 7H:161.

7W:122 Learning Strategies for Health Career Education 3 s.h.
Role of health specialist as teacher examined; variety of learning strategies explored through discussions, observations, and teaching; activities individualized to meet various backgrounds and objectives.

7W:130 Photography for Instruction 3 s.h.
Planning and production of instructional materials using still or motion picture photography; basic skills covered; major project required.

7W:132 Film in the Classroom 3 s.h.
Visual literacy course; provides classroom experiences for future teachers helping children express ideas visually using photographic techniques as strategies to learn subje area content.

7W:133 Introduction to Programmed Learning 3 s.h.
Theoretical basis of programming of learning; examinations of teaching machines and other devices for use in structuring of learning; model programs for automated teaching; frame construction.

7W:134 Videotape in Education 3 s.h.
Planning and production of videotaped units for instructional applications; operation of VTR equipment, lighting, sets, scripting, editing, and graphics for videotape production; selection and evaluation criteria and guidelines for diffusion; practical experience in working with professional clients is provided.

7W:135 Computers in Education 3 s.h.

7W:180 Special Topics in Instructional Design and Technology arr.
Designed to cover areas of special interest for selected groups; content will vary from semester to semester.

7W:193 Independent Study Undergrad and Non-Majors arr.
Opportunity to investigate areas of specific concern to students. Prerequisite: consent of instructor.

7W:209 Computer in Instructional Design 3 s.h.
The nature and use of computers and their potentials and limitations in instruction.

7W:220 Advanced Instructional Design and Technology 3 s.h.
Prerequisites: 7W:103, 7W:120.

7W:235 Techniques of Instructional Design 4 s.h.
Application of the systems approach to the design of instructional materials: students employ techniques taught to the development, revision and documentation of a block of instructional material in students' areas of special competency. Prerequisite: consent of instructor.

7W:238 Graphic Communications 3 s.h.
Theory and principles for preparing educational and instructional graphics. Covers planning, use of graphic tools and materials, message design, layout, lettering, scripting, simple drawing, etc. Prerequisites: 7W:91, 7W:103, plus one course in Instructional Design.

7W:240 Administration of Educational Media Programs arr.
Principles of organizational and personnel management as they apply to directing the media program. Prerequisite: 7W:103, 7W:120 or equivalent.

7W:261 Research Methods in Instructional Design and Technology 3 s.h.
Research practices, experimental design considerations and writing for publication. Prerequisites: 7P:143 or equivalent, 7W:120, 7W:269 and consent of instructor.

7W:262 Facilitating Learning in Health Sciences Education 3 s.h.
Role of health careers educator as leader and learning facilitator explored in detail; student experiences wide variety of learning strategies through readings, discussion, observation and microteaching. Same as 50:262, 7H:262.

7W:269 Survey Research in Instructional Design and Technology arr.
Survey of research from the behavioral sciences, communications technology, and message design as related to instruction.

7W:293 Independent Study: Instructional Design for Majors arr.
Opportunity to investigate areas of specific concern to the student. Prerequisite: consent of instructor.

7W:370 Practicum in Instructional Design and Technology arr.

7W:371 Internship in Instructional Design and Technology arr.
Off-campus supervised administrative and other nonteaching experience in public schools, social agencies, or industry. Prerequisite: consent of instructor.

7W:382 Division Seminar in Instructional Design and Technology arr.
May be repeated for credit.

7W:385 Seminar: Visual Learning, Thinking, and Communication arr.
Discussion of theory and research in the area of visual learning, thinking,and communication from applied and multidisciplinary perspective; understanding and appreciation of process of interdisciplinary approach and of its value when applied to significant problems.

7W:387 Topical Seminar in Instructional Design and Technology arr.
May be repeated for credit. Same as 50:263.

7W:393 M.A. Thesis: Instructional Design and Technology arr.
Prerequisite: consent of instructor.

7W:395 Ed.S. Project: Instructional Design and Technology arr.
Prerequisite: consent of instructor.

7W:493 Ph.D. Thesis in Instructional Design and Technology arr.
Prerequisite: consent of instructor.

Postsecondary and Continuing Education

Chair: Robert E. Engel
Faculty: *professors* H.B. Sagen, Arthur C. Burman *associate professors* Duane D. Anderson, Ray A. Muston, Chester S. Rzonca *associate professor emeritus* Leonard Davies *assistant professors* Robert E. Engel, Alan B. Henkin, Charles M. Mason
Degrees offered: B.S., M.A., Ed.S., and Ph.D.

B.S. in Health Occupations

The health occupations education major has been designed to prepare teachers for employment at the community college level in preparatory health occupations education programs. In addition to basic skill and core requirements of the College of Liberal Arts, students will complete courses in professional education and additional coursework in the health occupations education specialty field and/or supporting areas.

Students making application to this program must currently hold appropriate certification, licensure and registry appropriate to the area of health occupations education in which they wish to teach, e.g., dental assisting, medical office assisting, respiratory therapy, and the like. The health occupations education major is planned upon this base, and provides work in professional education and the liberal studies appropriate to teachers who wish to acquire a baccalaureate degree.

Applicants to this program must satisfy criteria for admission to the Teacher Education Program of the College of Education.

The health occupations education program has been submitted to the Iowa Department of Public Instruction for approval in teacher certification and career education requirements.

Program Requirements

Coursework in Professional Education

7P:131 Educational Psychology 3-4 s.h.
7P:150 Educational Measurement for the Classroom Teacher 2-3 s.h.
7F:102 History of American Education 2-3 s.h.
or
7F:107 History of Education 2-3 s.h.

Curriculum and Teaching Procedures

One course from each group:

Group I

7W:120 Introduction to Instructional Design and Technology 3 s.h.
or
7H:161 Designing Learning Programs for Health Sciences Education 3 s.h.

Group II

7H:162 Learning Strategies for Health Career Education 3 s.h.
or
7A:112 Teaching of Adults 3 s.h.

Group III

7H:271 The Community College 2-3 s.h.
or
7H:197 Philosophy of Vocational Education 2 s.h.

Additional Requirements

7H:191 Community College Teaching Internship 12 s.h.
7H:190 Seminar, Health Occupations Education 3 s.h.
Additional specialty coursework in health occupations education 10 s.h.

Students may avail themselves of special workshops or courses offered by specific health colleges when appropriate prerequisites have been met.

Coursework may also be taken in specific basic sciences supporting health occupations education.

In addition to coursework in the health specialty and basic sciences, students may also choose electives from the following:

7H:175 Post-High School Staff Development Workshop 0-2 s.h.
7P:143 Introduction to Statistical Methods 3 s.h.
7P:181 Introduction to Theories of Learning 3 s.h.
7P:285 Motivation in Education 3 s.h.
7C:110 Processes of Change and the Counselor 2-3 s.h.
7C:150 Psychological Aspects of Women's Roles 1-3 s.h.
7W:91 Audiovisual Equipment for Instruction 1 s.h.
7W:103 Selection and Use of Media for Instruction 2 s.h.
7W:120 Introduction to Instructional Design and Technology 3 s.h.

Coursework in the health occupations education specialty and supportive fields should be carefully planned in consultation with the adviser.

Graduate Programs

Higher Education

Master's Program (without thesis)

Purpose: To prepare students for entry-level staff and administrative positions such as assistant dean of instruction, in two- and four-year colleges.

Educational Specialist Program

Purpose: To provide the advanced graduate education needed by instructors at the undergraduate level in two- and four-year colleges and by administrators in higher education not planning to continue for the doctorate. The Educational Specialist degree may be awarded upon completion of a joint program in higher education and an academic discipline comprising a minimum of 60 semester hours of graduate work, or upon completion of a higher education sequence following a master's degree program.

Doctoral Program

Purpose: To prepare professional personnel for teaching, research and administration in higher education.

Adult Education

Master's Program (with or without thesis)

Purpose: To provide basic understanding of adult learning theory, instructional methodology and adult group processes in preparation for careers as professional adult educators or in areas that involve working with adults in such areas as schools, libraries, extension, public health and community development programs.

Doctoral Program

Purpose: To prepare for teaching, research and advanced leadership positions in the field of adult education; emphasis given to a broad background with cross-disciplinary relationships.

Iowa Community College Certification

Students who wish to meet certification requirements for community college teachers in Iowa (Endorsement 72) must complete a minimum of six semester hours of course work in higher education and/or closely related areas. Required (specific alternates may be chosen in consultation with the Office of Community College Affairs):

7H:271 The Community College	2-3 s.h.
7H:230 Intern Seminar	arr.
7H:330 College Teaching Internship	arr.
7A:112 Teaching of Adults	3 s.h.

A master's degree in the student's teaching area is required for certification in arts and science areas.

Special Facilities

A resources and document collection relating to community colleges is available for students doing research or seeking employment information.

Courses

Adult Education

7A:110 Introduction to Adult Education 3 s.h.
Philosophy and scope of adult education movement in United States.

7A:112 Teaching of Adults 3 s.h.
Adult learning factors and consideration of recognized variations in teaching techniques for adults.

7A:221 Administration of Adult Education 3 s.h.
Methods of inaugurating and operating adult education activities in public schools.

7A:223 Problems and Issues in Adult Education 2 s.h.
Perspective; institutional roles; interrelationships between youth and adult education; process, program and potential of field.

7A:293 Individual Instruction in Adult Education arr.
Prerequisite: consent of instructor.

7A:297 Workshop: Adult Education 0-2 s.h.

7A:312 Seminar: Adult Education 2 s.h.
Prerequisite: consent of instructor.

7A:493 Ph.D. Thesis in Adult Education arr.
Prerequisite: consent of instructor.

Higher Education

7H:93 Individual Study: Higher Education arr.
Prerequisite: consent of instructor.

7H:100 Problems and Policies in Higher Education 3 s.h.
Study and analysis of current selected functions, problems and policies in American higher education. A basic course open to nonmajors and undergraduates.

7H:161 Designing Learning Programs for Health Science Education 3 s.h.
Information/discussion on such topics as the systems approach to instructional design, writing educational objectives, construction of self instructional learning packets, developing clinical evaluation tools, writing objective examinations, affective evaluation. Same as 7W:121, 50:161.

7H:162 Learning Strategies for Health Career Education 3 s.h.
Role of health specialist as teacher examined; variety of learning strategies explored through discussions, observations and teaching; activities individualized to meet various backgrounds and objectives.

7H:175 Post-High School Staff Development Workshop 0-2 s.h.
Designed to provide post-high school instructors with work in either discipline areas or in some aspect of professional education; workshop topics may include programs for upgrading of administrative and supportive personnel as well as faculty members in post-high school institutions.

7H:190 Seminar Health Occupations Education 3 s.h.
Analysis of teacher behavior as it relates to instruction in health occupations education and trends in providing health care services; self-evaluation, program evaluation, legislation affecting health occupations education programs.

7H:191 Community College Teaching Internship arr.
Full academic term of teaching experience consisting of supervised one-half time teaching load at a community college; concurrent assignment to gain knowledge of institution policies and procedures; attention also given the role of professional associations.

7H:193 Higher Education Colloquium arr.
Students and faculty invited to submit seminar topics and other projects for consideration. May be repeated once for credit up to total of 6 s.h.

7H:197 Philosophy of Vocational Education 2 s.h.
Study of vocational education programs with special emphasis on curriculum development, work experience, job analysis and changing vocational needs of business and society. Required for teacher coordinators of office education. Same as 6S:197.

7H:211 Problems in College Teaching 2-3 s.h.
Principles of course planning, teaching procedures, evaluation techniques and assessment of instructional objectives and outcomes.

7H:220 History and Philosophy of American Higher Education 3 s.h.
Includes identification of major themes and developments in American higher education and study of the ideologies, people and movements which have particularly influenced those developments.

7H:222 Educational Policies and Programs in America 3 s.h.
Issues of federal, state and institutional policy; types of institutions; institutional functions; basic policy questions regarding the development and management of educational programs.

7H:224 Organizational Analysis of American Higher Education 3 s.h.
Theories and concepts of organizational behavior related to the structure, organization and administration of American higher eduction. Prerequisite: consent of instructor.

7H:226 Higher Education Management 2-3 s.h.
Centered on the dimensions which influence the decision-making process in American higher education; basically application oriented, involving analysis of the students' own administrative skills. Prerequisite: background in organizational and administrative theory or consent of instructor.

7H:230 Intern Seminar arr.
Designed to prepare interns to assume faculty or administrative roles in community college setting. Prerequisite: enrollment in community college teacher preparation program or preparing to enroll in community college internship program during following term.

7H:240 Workshop: Higher Education 0-2 s.h.

7H:250 Administration of Technical-Educational Programs 2-3 s.h.
Administrator's role in post-high school occupational education; legal, financial and staffing aspects of vocational-technical and semiprofessional education.

7H:262 Facilitating Learning in Health Sciences Education 3 s.h.
Role of health careers educator as leader and learning facilitator explored in detail; student experiences wide variety of learning strategies through readings, discussion, observation and microteaching. Same as 7W:262, 50:262.

7H:271 The Community College 2-3 s.h.
Survey of problems in organization, administration and curriculum.

7H:275 Iowa Community College Workshop 0-1 s.h.

7H:285 Leadership in Health Careers Education 3 s.h.
Exploration of educational leadership in health careers education: including such activities as consultation, administration and supervision, evaluation, coordination, and grant writing. Prerequisite: consent of instructor.

7H:293 Individual Instruction in Higher Education arr.
Prerequisite: consent of instructor.

7H:295 Master's Research in Higher Education 3 s.h.
Fulfills the research requirement of the nonthesis program topic to be approved by the advisor.

7H:305 Seminar: Recent Research in Higher Education 2 s.h.
Analysis of recent research in the field, with special emphasis on the development of critical thinking and research skills; preparation and presentation of one major research project.

7H:310 Seminar: Education for the Professions 2-3 s.h.
Characteristics of the professions and their educational implications, the role of theory and practice, clinical experiences; each student will analyze education for a selected profession. Prerequisite: consent of instructor.

7H:311 Seminar: Innovation in Higher Education 2-3 s.h.
Potential fundamental changes in the educational program; change strategies. Prerequisite: consent of instructor.

7H:315 Curriculum Development in Higher Education 2-3 s.h.
Prerequisite: consent of instructor.

7H:316 Theory and Practice of Planning in Higher Education 2-3 s.h.
Planning processes and applications in higher education at the institutional, state, and national levels. Analysis and appraisal of exemplary institutional and agency plans.

7H:317 Administrative Decision-Making in Higher Education 2-3 s.h.
Administrative problems in higher education using simulated materials. Prerequisite: 7H:226, or consent of instructor.

7H:330 College Teaching Internship arr.
Full semester teaching experience consisting of supervised one-half-time teaching load at community college level or at undergraduate level in a four-year institution; concurrent instructional-research assignment. Prerequisites: 7H:230, consent of instructor and approval by cooperating institution.

7H:333 Practicum in Higher Education arr.
Prerequisite: consent of instructor.

7H:360 Seminar: History and Philosophy of American Higher Education 3 s.h.
European foundations; relationships to development of cultural, intellectual, and institutional life of United States; effects on present and future of higher learning in U.S. Prerequisite: 7H:220 or appropriate background in philosophy and history, or consent of instructor.

7H:364 Seminar: Health Careers Education 1 s.h.
Forum for examining issues and special problems in health careers education, exchanging ideas, and relating academic studies to role of health careers educator; may be repeated. Prerequisite: consent of instructor.

7H:393 M.A. Thesis in Higher Education arr.
Prerequisite: consent of instructor.

7H:395 Educational Specialist Research in Higher Education arr.
Prerequisite: consent of instructor.

7H:401 Pro-Seminar in Higher Education 1-2 s.h.
Current topics and major areas of professional and research interest. Intended for Ph.D. majors in higher education. May be repeated up to a total of four s.h. Prerequisite: consent of instructor.

7H:493 Ph.D. Thesis in Higher Education arr.
Prerequisite: consent of instructor.

Secondary Education

Chair: John E. McAdam
Faculty: *professors* G. Robert Carlsen, Robert M. Fitch, John H. Haefner, John E. McAdam, Erwin H. Schneider, Harold L. Schoen, Robert E. Yager, Marilyn J. Zweng
professors emeriti Camille J. LeVois, Hugh F. Seabury, Lauren A. Van Dyke
associate professors John W. Conner, George W. Cossman, Stuart C. Gray, Gary F. Hansen, Steven K. Hedden, David K. Leslie, Vincent N. Lunetta, John W. McLure, John E. Penick, Edward L. Pizzini, Jeannette Scahill, George W. Walker, John T. Wilson, Sara C. Wolfson
associate professors emeriti Lester G. Benz, Louane L. Newsome
assistant professors Iva M. Bader, Wendell C. Boersma, Murray Martin, Daniel S. Sheldon, Douglas M. Trank, Martha Taunton
instructors John M. Butler, Richard P. Johns
Degrees offered: M.A., M.S., M.A.T., Ed.S., Ph.D.

The primary mission of the Division of Secondary Education is to strive for excellence in instruction in secondary schools. In fulfilling this mission, it must constantly investigate what constitutes excellence and the possibilities of its instrumentation in the schools. Part of such investigation comes from a collation of research, theory and teaching practices in secondary education. Part of it must come from laboratory experimentation with students and teachers in schools in which there is freedom to innovate.

The concept of excellence in instruction undergirds the education of teachers, supervisors, curriculum directors and teacher-educators and administrators who will directly serve the secondary schools. The Division provides preparation programs for personnel in all secondary areas for which the University has viable programs of academic offerings.

Persons who guide and facilitate the learning experiences of secondary school students must have an understanding and appreciation of adolescents, a sound background in the liberal arts, an open attitude toward contemporary society and its problems, and enthusiasm for the subject taught.

Junior and senior high school teachers usually specialize in a particular subject, although they often teach classes both in their major subject and in related subjects. Teachers of home economics, agriculture, music, art, industrial arts, and business education, less frequently than other teachers, conduct classes in subjects outside their major field.

In addition to guiding the learning experiences of students in the classroom, secondary teachers plan and develop teaching materials, construct and correct tests, keep records and make out reports, consult with parents, and perform other administrative duties.

They are also involved in directing and supervising student activities, including clubs and social events, and they participate in out-of-school affairs as interested members of the community in which they teach. Developing and maintaining effective relations with parents and the local community is an important facet of the teacher's responsibility.

Undergraduate programs

Students preparing for secondary school teaching must fulfill the general requirements for a bachelor's degree in the College of Liberal Arts or in the College of Business Administration, must fulfill the requirements for a major in a specific department or division in the College of Liberal Arts or College of Business Administration, and must complete the professional courses necessary for Iowa teacher certification, totaling from 22-28 semester hours, which

includes a practicum experience for a semester during the senior year.

Students preparing to teach art, music or physical education typically take methods courses and acquire student-teaching experience at both the secondary and elementary levels.

During the freshman and sophomore years, the student completes most of the general requirements for the bachelor's degree by acquiring proficiency in rhetoric, mathematics, physical education and a foreign language, and by satisfying core requirements in literature, natural science, social science and historical-cultural fields.

Program Requirements

Foundations Courses

Undergraduate candidates for a certificate to teach in a secondary school (junior or senior high school) should complete the foundations courses listed below in their sophomore or junior year. Graduate students may, with the approval of their advisers, elect equivalent graduate courses which satisfy the foundation requirement.

7S:91 Pre-Education Practicum	2 s.h.
7S:100 Introduction: Secondary School Teaching	2 s.h.
7P:75 Educational Psychology and Measurement	3 s.h.

Methods and Student Teaching

Students must complete the special methods course in their major teaching field prior to the semester in which they elect to do student teaching. Students should make application for student teaching by March 15 preceding their senior year. The student teaching period is one full semester for 12 semester hours of credit.

Students with certain teaching majors may be required to register in one of the optional courses listed below concurrently with 7S:191-192 Observation and Laboratory Practice in the Secondary Schools. Faculty advisers should be consulted about this requirement before registration.

7S:190 Individual Projects in Laboratory Practice	1- 3 s.h.
7S:187 Seminar Curriculum and Student Teaching	1-3 s.h.
7W:103 Selection and Use of Media for Instruction	2 s.h.

Teaching Majors and Minors

A sufficient number of courses must be completed to satisfy the requirements for a teaching major in a department within the College of Liberal Arts or the College of Business Administration. The completion of an academic major as defined by the major department will satisfy this requirement in most cases.

It is suggested that students elect sufficient work in a field outside the area of the major to be recommended by the University for teaching in a second field (20-24 s.h.). Copies of the teaching major and minor requirements are available in the College of Education Office and at the Secondary Education Division office.

Graduate Program

Members of the Division of Secondary Education serve as advisers to graduate students who are candidates for the M.A.T., M.A., M.S., Ed.S., or Ph.D. degrees.

Opportunities are provided for advanced study in such fields as secondary school administration, secondary school curriculum, art education, business education, English education, mathematics education, music education, physical education, science education, social studies education and speech education.

Programs leading to the M.A.T. degree are provided in some teaching fields for students with superior academic records who have earned the baccalaureate degree but who have not completed work for teaching certification at the undergraduate level. Other graduate programs leading to the M.A. or M.S. and Ed.S. degrees, which usually combine advanced work in the academic disciplines and professional education, are designed to enhance the preparation of master teachers, department heads, supervisors, curriculum consultants, directors, and coordinators for secondary schools and community colleges.

More extensive interdisciplinary programs leading to the Ph.D. degree also prepare individuals to serve as college or university instructors in their respective fields of specialization in colleges of education or in the academic department of their major field, in addition to the types of positions previously mentioned. Some of the interdisciplinary programs are administered jointly by the College of Education and other academic departments of the University.

Programs leading to the M.A., Ed.S. and Ph.D. degrees are also provided for the preparation of administrative and supervisory personnel who may assume positions of leadership in the field of secondary education, including college and university instruction in this area.

Generally speaking, the minimum requirements pertaining to admission, registration, academic standing, residency, etc., of students in advanced degree programs in secondary education do not exceed the requirements outlined in the "Manual of Rules and Regulations of the Graduate College." Two major exceptions to this generalization do frequently occur, however: applicants for admission to most of the degree programs in this Division require a year or more of successful teaching experience, and in the cases noted in the following matrix, the minimum grade-point requirement exceeds the Graduate College minimum.

The following are the types of advanced programs offered by the Division of Secondary Education:

Secondary School Curriculum—M.A., Ph.D.
Art Education—M.A., M.A.T., Ph.D.
Business Education—M.A., M.A.T., Ph.D.
English Education—M.A.T., M.A., Ph.D.
Mathematics Education—M.A., Ph.D.
Physical Education — M.A., Ph.D.
Science Education—M.A.T., M.A., M.S., Ph.D.
Social Studies Education—M.A., Ph.D.
Speech Education—M.A.

Minimum grade-point average for admission is 3.0. More specific information about such items as admission requirements and procedures, required and elective courses, tool requirements and comprehensive examinations in the various advanced degree programs cited above is contained in the bulletin entitled *Advanced Studies in Education*.

Financial Aids

A limited number of half-time assistantships is available for students pursuing Ph.D. degrees in secondary education. Holders of such assistantships are permitted to register for no more than 12 hours per semester. Unless special permission is granted, holders must register for at least nine hours per semester. The assignments of assistants vary. Some involve the participants in teaching selected undergraduate courses or in the supervision of practicum experiences. Other assignments are primarily in research.

Courses

7S:91 Pre-Education Practicum 1-2 s.h.
Involves observing and assisting students and assisting teachers in performing daily tasks for six hours per week. To be taken concurrently with 7S 100.

7S:100 Introduction: Secondary School Teaching 2 s.h.
Overview of contemporary American secondary education, including needs and characteristics of students and teachers, the nature of life in schools; organization and control of education; educational innovations.

7S:101 Introduction to Education 3 s.h.
Basic orientation in field of education; consideration of administrative organization, instructional procedures and contemporary problems at both elementary and secondary levels. Same as 7E:101.

7S:102 Directing Speech Activities 3 s.h.
Planning, organizing and evaluating curricular and cocurricular speech programs in secondary schools; directing contest plays, preparing for competitive speech and drama activities. Same as 36:107.

7S:103 Decision Making for Consumers 3 s.h.
Application of problem solving in such cases as consumer credit and financial decisions; emphasis on citizen's consumer responsibilities and basic economic principles; exploration of consumer assistance and consumer action. Same as 6S:103.

7S:104 Principles of Basic Business 3 s.h.
Integration of principles of business structure and finance with fundamental principles of economics and personal finance; intended primarily for secondary school teachers of business and social studies subjects. Same as 6S:104.

7S:105 Advanced Methods: Art 3 s.h.
Theory and methods of art education at elementary and secondary levels; art curriculum, unit, and lesson planning, evaluation, motivation, and instructional materials; observational techniques.

7S:106 Introduction to Environmental Studies for K-12 Programs 2-3 s.h.
An introduction to materials and activities available for introducing environmental studies in the K-12 curriculum as a course sequence and model to supplement existing curricula. Same as 7E:106.

7S:107 Implementation of Environmental Studies for K-12 Programs I 2 s.h.
Consideration of seasonal activities in the area of environmental studies; associated with classroom implementation of activities in the area of environmental studies. Same as 7E:107.

7S:108 Implementation of Environmental Studies for K-12 Programs II 2 s.h.
Continuation of 7E:107/7S:107 for the spring. Same as 7E:108.

7S:109 Basic Business and Consumer Issues 3 s.h.

7S:110 Methods: Business Subjects 3-6 s.h.
Study of objectives, content, materials, and methods for teaching business subjects; modules offered in typewriting, shorthand, office education, bookkeeping/accounting, basic business. Offered in fall only. Prerequisites: 6S:191 and consent of instructor. Same as 6S:192.

7S:113 Methods: Secondary School Journalism 3 s.h.
Improving journalism activities in secondary schools with focus on methods of teaching; problems involved in advising student publications and attention to the production of school publication. Same as 19:140.

7S:115 Methods: English 3, 6 s.h.
Instruction in methods, materials and organizational techniques in teaching high school English; during laboratory sessions, integrated with lectures and discussions, students receive experience in simulated teaching situations. Same as 8P:190.

7S:116 Methods: Foreign Language 3 s.h.
Emphasizes facilitation of learning foreign languages in secondary schools; includes study of methods and materials demonstration and practice of teaching techniques and organizing teaching. Same as 9:150, 13:120, 20:119, 35:130.

7S:117 Workshop Introduction to Intermediate Science Curriculum Study for Junior High Science 2-3 s.h.
Reviews currently available science programs and minicourses developed specifically for the junior high school; particular emphasis on the ISCS program.

7S:118 Implementation of Intermediate Science Curriculum Study for Junior High School Science I 2 s.h.
Particular emphasis on individualizing instruction and associated classroom management procedures.

7S:119 Implementation of Intermediate Science Curriculum Study for Junior High School Science II 2 s.h.
Continuation of 7S:118.

7S:124 Language Laboratory Equipment Procedures 1-2 s.h.
Use and utilization of language laboratory equipment and materials. Same as 9:151, 35:131.

7S:125 Methods: Home Economics 3 s.h.
Philosophy, materials and methods in home economics. Required for home economics endorsement and vocational approval. Same as 17:120.

7S:126 Materials and Methods in Family Life Education 3 s.h.
Philosophy, resources and methods of presenting family life education materials in elementary, middle, junior high, high school and adult education. Same as 17:122.

7S:127 Workshop Introduction to Technology-People-Environment K-12 Science Enrichment 2-3 s.h.
Introduction to materials and activities available to provide students K-12 with interdisciplinary, holistic approach to the study of current and future sociotechnological problems and issues. Same as 7E:127.

7S:128 Implementation of Technology-People-Environment K-12 Science Enrichment I 2 s.h.
Consideration of activities, materials, and implementation strategies which facilitate learning when the elementary or secondary student is unfamiliar with the content, disadvantaged, or unmotivated. Same as 7E:128.

7S:129 Implementation of Technology-People-Environment K-12 Science Enrichment II 2 s.h.
Continuation of 7E:128/7S:128. Same as 7E:129.

7S:130 Workshops for Secondary School Journalism Communication Teachers 2-3 sn .
Selective workshops designed for teachers responsible for journalism publication, programs or mass media classes; emphasis on basic journalistic skills, advising school publications, editorial content, photography, design and typography, curriculum development and teaching of consumer mass media; workshops enable teachers to meet state certification requirements. Same as 19:142.

7S:131 Teaching Social Studies in Middle Grades and Junior High 2-3 s.h.
Understanding of early adolescence; selecting and designing practical classroom materials for middle and junior high school students; familiarizing students with teaching approaches and strategies for this age group; practicum work in a local junior high school.

7S:135 Methods: Mathematics 4 s.h.
Survey of modern subject matter, organization of content and techniques of teaching. Prerequisite: 22M:50 and 22M:55 or consent of instructor.

7S:137 School Physical Education Programs 2 s.h.
Biological, social and psychological factors influencing curriculum in physical education, current program trends stressed. Same as 27:137, 7E:137.

7S:138 Practicum: Band Instrument Care and Repair 1 s.h.

7S:139 Methods of Teaching Spanish 3 s.h.
Same as 35:139.

7S:140 Band Methods and Materials 3 s.h.
Required of all instrumental music education majors; both high school and elementary school music methods required for teaching certificate; includes care and repair of instruments.

7S:141 Seminar: Contemporary Issues in Music Education arr.
Current developments in music and education with implications for music curriculum development and teaching practice. Same as 25:299.

7S:142 Methods and Materials: Secondary School General Music 3 s.h.
Emphasis upon literature, methods, materials and organizational plans of general music course in junior high school, and upon role of music in allied arts and humanities-related arts courses in senior high school.

7S:143 Instrumental Techniques 1-3 s.h.
Same as 25:105.

7S:144 Psychology of Music I 2 s.h.
Nature of musicality, perception, aesthetic response, musical abilities of children and music learning.

7S:145 Methods: Secondary Physical Education 3 s.h.
Exposure to a wide spectrum of methodologies, types of teaching behavior, classroom procedures, program planning, learning theory and classroom control; considerable emphasis on preparation of teaching materials and micro-teaching lessons.

7S:146 Methods and Principles of Physical Education 3 s.h.
Same as 28:119.

7S:147 Choral Methods and Conducting 3 s.h.
Same as 25:109.

7S:148 Choral Literature and Conducting 3 s.h.
Prerequisite: 7S:147. Same as 25:110.

7S:149 Laboratory: Psychology of Music 2 s.h.
Experiences in analyzing and measuring sound stimuli and behavioral responses to such stimuli.

7S:150 String Methods and Materials 3-4 s.h.
Same as 25:112.

7S:151 Science Methods I: Individualizing Instruction in Science 2 s.h.
Integration of instructional theory and science curriculum with classroom practice; students participate in a series of clinical experiences in science with emphasis upon methods for personalizing the science curriculum. Corequisite: 7S:191.

7S:152 Science Methods II: Resources and Teaching Strategies 2 s.h.
Seminar designed to develop overall rationale for dealing with classroom science instruction; students design, teach, and evaluate a science unit in a secondary school; specific materials for teaching science and strategies for their effective use. Prerequisite: 7S:151.

7S:153 Workshop in Theatre Performance arr.
Directing, technical, arts management; discussion and application of directing techniques, technical practice and

arts management procedures; scheduling of such projects determined by interests of those involved. Acting ensemble: ensemble warmup, improvisation, rehearsal and performance; plays to be selected when company is known and to be performed during final week of term. Same as 36T:153.

7S:154 Current Issues, Approaches and Materials in Foreign Language Education 3 s.h.
Survey of methods, materials and recent curriculum developments in secondary-level foreign languages. Same as 35:177, 9:152.

7S:155 Introduction to Alcohol Education 2 s.h.
Basic information on alcohol use, abuse and alcoholism problem; for elementary and secondary teachers; value to teachers preparing alcohol education units in biology, chemistry, social sciences, driver education, physical education, health education and other subject areas.

7S:157 Developing School and Community Programs to Reduce Drug Abuse 1-2 s.h.
Primarily for inservice and preservice teachers, administrators and counselors; assists schools and teachers to develop local school and community contemporary drug education curricula and programs.

7S:158 Methods and Materials in Health Education 3 s.h.
Introduction to philosophy, current methods, materials and concepts in health education in grades 7-12. Required for Health Education 7-12 certification.

7S:160 Methods: Speech 3 s.h.
Teaching speech, dramatics, and forensics. Same as 36:160.

7S:161 Introduction to New Activities Science Programs K-12 2-3 s.h.
Introduction to integrating instructional materials from major curricular programs; recent curriculum research and development will be emphasized. Same as 7E:151.

7S:162 Implementation of New Activities Science Programs K-12 I 2-3 s.h.
Emphasis on classroom implementation of new activities for an activity-based science classroom; supplemental and enrichment materials and activities. Same as 7E:152.

7S:163 Implementation of New Activities Science Programs K-12 II 2 s.h.
Continuation of 7E:152/7S:162. Same as 7E:153.

7S:164 Human Science Program for Junior High School Science 2-3 s.h.
Introduction to the materials, rationale and methodology of the Human Science Program; explores related units developed locally and available from the Science Education Center. Same as 7E:154.

7S:165 Human Science Program for Junior High School Science I 2 s.h.
Emphasizes classroom implementation of Human Science Program and related units; supplemental and enrichment materials and activities. Same as 7E:155.

7S:166 Human Science Program for Junior High School Science II 2 s.h.
Continuation of 7E:155/7S:165. Same as 7E:156.

7S:167 Introduction to Intermediate Science Instructional System for Secondary School Science 2-3 s.h.
Introduction to materials, rationale and methodology of Individualized Science Instructional System (ISIS) program.

7S:168 Implementation of Intermediate Science Instructional System for Secondary School Science I 2 s.h.
For teachers adopting or adapting the ISIS program in their classrooms, emphasizes classroom management and supplemental activities.

7S:169 Implementation of Intermediate Science Instructional System for Secondary School Science II 2 s.h.
Continuation of 7S:168.

7S:170 Methods: Social Studies 3 s.h.
Organizing social studies content for teaching purposes, building classroom tests, learning procedures and new strategies in teaching; practicum work including micro-teaching, observation, student case studies and class interaction analysis.

7S:171 Selected Topics in Social Studies arr.
Broad exposure to archaeological techniques and interdisciplinary studies during the excavation of a late prehistoric Indian site; previewing of teaching materials available for school use.

7S:172 Teaching Special Topics in Human History 1 s.h.
Emphasis on status of history in the curriculum; examination of current topics such as Black, Chicano, and Native American history; the role of discovery and inquiry as approaches; various materials such as those of the Iowa History Project and From Subject to Citizen will be available for study.

7S:173 Approaches and Materials in Citizenship Education 1 s.h.
Focusses on familiarization with new materials and teaching strategies designed to stress concepts, understandings, abilities and values, related to political behavior; illustrative materials drawn from several new courses being developed; participants actively engage in teaching lessons from materials, participating in simulations and similar "hands on" procedures.

7S:174 Workshop: Future Studies 2 s.h.
Rationale, goals, objectives, content issues, and topics of future studies; assessment of materials and media for teaching; developing units and courses; methods and techniques of teaching.

7S:175 Studies in Citizenship Education: Political, Social and Economic 2 s.h.
New materials and teaching approaches for courses in American government, economics, sociology and Problems of American Democracy; opportunity to become thoroughly acquainted with materials from American Political Behavior, Comparing Political Experiences, Economics in Society and Sociological Resources in the Social Studies.

7S:176 Futurism in Education 3 s.h.
The concept of the future from a wide range of sociological and psychological perspectives as they affect education; examines the question of how educators can most efficaciously prepare themselves to cope with a succession of a variety of educational futures; seeks to promote a pro-active educational response to the issues and problems of education in the future.

7S:177 Theatre Production Institute arr.

7S:178 Workshop in Teaching Drama, Forensics and Speech arr.
Focus on methods and materials for teaching speech and drama at various levels and in various situations; opportunities for survey of textbooks, references and periodicals in Education and University Libraries; study of courses of study and other curriculum materials in the Curriculum Laboratory and examination of films, tapes, and other resource materials in the Audio-Visual Center. Same as 36:178.

7S:179 Workshop in Group Oral Interpretation arr.
Theory and practice of various approaches to a readers' theater program. Same as 36:179.

7S:180 Workshop in Teaching Mass Communication and Media in Secondary Schools arr.
Nonprint media, with emphasis on film criticism; production of radio and film programs. Same as 36:180.

7S:181 Workshop in Interpersonal Communication arr.
Designed especially for public school teachers interested in incorporating new concepts of nonverbal communication, interpersonal communication, and human relationship study into classroom situation. Same as 36:181.

7S:182 Workshop in Creative Dramatics arr.
Uses of creative dramatics for K-12 pupils; approaches to criticism of children's literature. Same as 36:182.

7S:183 Workshop in Teaching the Basic Course in Public Communication arr.
Students examine recent text and materials appropriate for the first course in communication, and develop strategies for the organization and the teaching of the course. Same as 36:183.

7S:185 Art Education Workshop 2-3 s.h.
Curriculum content for secondary school art; emphasis on recent procedures, new methods and materials; includes studio practice, field trips, demonstrations, observations, clinical teaching experiences. Same as 7E:185.

7S:186 Curriculum Foundations 2-3 s.h.
Elementary and secondary background developments in curriculum; definitions, historical perspective, philosophies, theories of knowledge, models, learning theories, directions of development and shaping forces; product oriented. Same as 7E:186.

7S:187 Seminar: Curriculum and Student Teaching 1-3 s.h.
Discussions, role-playing, group and individual reports, analyses of critical incidents, viewing of videotapes of students' classroom performances and those of peers; all pertaining to participants' student-teaching experiences.

7S:190 Individual Projects in Laboratory Practice 1-3 s.h.
Projects concerned with curriculum and instruction related to program of school in which student teaches under the direction of University supervisors of student teaching; culminates in written report on projects.

7S:191 Observation and Laboratory Practice in the Secondary School arr.
Affords student teachers opportunities to acquire a semester of experience in performing duties of regular classroom teachers under relatively close supervision in junior and senior high school. Prerequisite: consent of instructor.

7S:192 Observation and Laboratory Practice in the Secondary School arr.
Continuation of 7S:191. Prerequisite: consent of instructor.

7S:193 Literature for Adolescents 3 s.h.
Reading and evaluation of literature suitable for junior and senior high school student. Same as 21:193, 8P:198.

7S:194 Methods: High School Reading 2-3 s.h.
Methods and materials used in developmental reading instruction in junior and senior high school.

7S:195 Developing Reading Skills in the Secondary School 2-3 s.h.
Basic instruction in improvement of high school students' reading skills; basic factors underlying need for remedial rather than developmental instruction; implementing continuous instruction in reading skills from kindergarten through high school.

7S:197 Aesthetic Education 2 s.h.
Introductory course designed to acquaint art education students (and other interested education students) with aesthetic model for education; study of role arts serve within framework of general classroom related to other subject matter. Same as 7E:197.

7S:199 Special Topics in Secondary Education 1-3 s.h.
Designed to provide experience with recent developments in methods of teaching secondary school subjects. Aimed at preservice and inservice teacher audiences.

7S:201 Foundations of Business Education 3 s.h.
Underlying philosophies, ideas, concepts, and principles which have guided business education programs at the secondary, postsecondary, and collegiate levels; thought and practices pertaining to education generally and to business education, career education, and vocational education specifically. Same as 6S:201.

7S:203 Seminar Basic Business 2-3 s.h.
Applications of curriculum development principles to the teaching of basic business subjects; emphasis on economics principles and consumer learning underlying all basic business subjects. Same as 6S:203.

7S:204 Seminar Teaching Accounting 2-3 s.h.
Accounting principles and cyclical analysis; application of teaching techniques. Primarily for high school and community college teachers of bookkeeping, accounting, and data-processing subjects. Same as 6S:204.

7S:205 Seminar: Office Education 1-3 s.h.
Trends and research in office education at high school and community college levels; methods of individualized instruction, correlation of classroom instruction with work experience and evaluation techniques in office education. Required for coordinators of cooperative office education programs. Same as 6S:205.

7S:206 General Music Programs in the Public Schools 3 s.h.
Curriculum development, instructional materials, and analyses of current teaching methods and techniques in general music instruction in public schools. Same as 7E:206.

7S:210 Managing Business Instruction 3 s.h.
Development of effective business teaching at all educational levels; principles of effective instructional design, methodology, and supervision. Same as 6S:210.

7S:211 Seminar: Business Teaching 2-3 s.h.
Intensive study of selected issues in business education. May be repeated once for credit. Same as 6S:240.

7S:215 Seminar: Teaching English in Middle School and Junior High School 3 s.h.
Consideration of current approaches in teaching English at this level.

7S:216 Problems in the Teaching of English 2 s.h.
Framework for studying current issues in language arts, issues secondary English teachers must understand and cope with to provide quality instruction for adolescents.

7S:219 Workshop: Foreign Language Projects 1-3 s.h.
Explores teaching strategies and materials in specific areas. Development of lessons and materials for local school situations.

7S:230 Workshop in Secondary School Mathematics 0-3 s.h.
Topics vary from year to year; designed to provide 1-3 weeks of intensive examination of and experience with recent developments in methods of teaching secondary school mathematics and curriculum relevant to a selected issue.

7S:235 Current Issues, Approaches and Materials in Secondary School Mathematics Teaching arr.
Prerequisite: consent of instructor. Same as 22M:195.

7S:236 The Teaching of Geometry 3 s.h.
Current developments in teaching of secondary school geometry and selection and organization of content.

7S:237 Teaching Mathematics in Middle School and Junior High School 2-3 s.h.
Survey of methods, materials and recent curriculum developments for junior high school mathematics including teaching of computation, problem solving, introductory algebra and informal geometry.

7S:238 Teaching the Low Achiever in Mathematics 2-3 s.h.
Implementing programs for improving both attitude and mathematical proficiency of low achievers in mathematics. Same as 7E:238.

7S:239 Teaching of Algebra arr.
Current developments in curriculum and instructional methods in secondary school algebra including classroom use of the history of algebra, use of computer and electronic calculators, implications of current research for the algebra teacher.

7S:240 Supervision and Administration of Music 3 s.h.
Open to graduate students and experienced teachers with consent of instructor.

7S:241 Instrumental Music Workshop 1-2 s.h.
Same as 25:220.

7S:242 Supervision of Physical Education 3 s.h.
Designed primarily for administrators and experienced teachers who wish to increase their understanding of supervisory functions and procedures in physical education; emphasizes role of supervisor in improvement of instruction; various types of teacher evaluation instruments compared. Same as 27:242, 7E:242.

7S:243 Supervision and Curriculum Development in Art Education 2-3 s.h.
Problems and responsibilities of art supervisor including curriculum facilities, financing, supervision, inservice training and reporting; study of factors influencing art curriculum decisions; curriculum analysis, selection, organization, preparation and evaluation. Same as 7E:243, 1E:243.

7S:244 Individual Projects in Music Education 2 s.h.

7S:245 The Psychology of Music II 3 s.h.
Nature of musicality, perception, aesthetic response, musical abilities of children and music learning.

7S:250 Program and Research Problems in Science Education 2 s.h.
Identification of program and research problems; group involvement in preparing solutions, including potential external funding sources. Same as 7E:250.

7S:251 Preparation of Curriculum Materials for Secondary School Science 2 s.h.
Preparation of instructional materials for science courses. May be repeated.

7S:252 Designing Strategies for Science Instruction 2 s.h.
Strategies and instructional models characterizing science instruction at the elementary, secondary, and college levels.

7S:253 Recent Curriculum Developments in Science 2 s.h.
Review of national curriculum efforts for school science, including the materials, the rationale, the teaching strategies.

7S:254 Administering and Supervising K-12 Science Programs 2 s.h.
Problems, practices, responsibilities and techniques characterizing position of science supervisors; articulation of K-12 programs; practicing science supervisors utilized. May be repeated. Primarily for supervisor trainees and advanced students. Same as 7E:366.

7S:255 Structure of Science and its Application in Science Teaching 3 s.h.
Intermediate topics in philosophy and psychology of science, implications for research and practice in science education. Prerequisite: previous work in philosophy or psychology of science.

7S:256 History of Science and its Role in Science Instruction 3 s.h.
Extends historical and sociological understanding of the nature of science and explores applications of that understanding to problems and issues in science education. Prerequisite: previous work in history or sociology of science.

7S:257 Designing Curricula for Science Instruction 2 s.h.
Theory and techniques for designing printed and laboratory material for science programs.

7S:263 Seminar: Problems and Methods in Studying and Teaching about Religion 2 s.h.
Discussion of various topics including the legal aspects of teaching about religion; religion as an academic discipline; methods of teaching about religion; relating to religious experiences of minority groups. Same as 32:263.

7S:264 Practicum Construction of Teaching Materials 1 s.h.
Construction of religious curriculum, actual practice in preparing units of courses dealing with religion. Same as 32:264.

7S:270 Curriculum Development in the Social Studies 2-3 s.h.
For school administrators, curriculum specialists and experienced social studies teachers; major areas include present status of social studies curriculum, trends growing out of curriculum research and development in past decade; problems involved in curriculum development and supervision; investigative study required.

7S:272 Current Issues, Approaches and Materials in Social Studies Teaching 3 s.h.
Emphasizes inquiry strategies for experienced teachers who will have opportunity to observe, participate in and create inquiry episodes; techniques include case studies, role play, simulation, laboratory lessons and value clarification.

7S:275 Advanced Techniques of Supervision in Social Studies 2-3 s.h.
For department heads, administrators and other supervisory personnel; new curricular material examined; problems of initiating curriculum change considered; patterns of performance analyzed and evaluated; strategies developed for improving teacher effectiveness.

7S:277 Seminar: Social Studies Education arr.
Particularly for master's and doctoral candidates in social studies education; emphasis on the periodical literature, trends, curricular developments and research in various aspects of social studies education. Same as 98:202.

7S:280 Junior High School and Middle School Organization and Administration 2-3 s.h.
History of junior high school and development of middle school; nature of preadolescent and early adolescent pupils; organizing program of studies; extracurricular programs; administrative techniques.

7S:281 Junior High School and Middle School Curriculum 2-3 s.h.
Comparison of practices in junior high school and middle school; objectives and content in various subject areas; current trends; curriculum planning.

7S:290 Improving Instruction in the Secondary School 3 s.h.
Upgrading the instructional program and consideration of special instructional problems in secondary schools, with an emphasis on innovative instructional approaches.

7S:291 Secondary School Curriculum 2-3 s.h.
Theory and development of secondary school curriculum; analysis of components of curriculum; study and discussion of practices and issues in various subject areas.

7S:293 Individual Instruction in Secondary Education arr.
Prerequisite: consent of instructor.

7S:294 Seminar: Secondary Reading arr.
Analysis and evaluation of pertinent research in secondary reading utilizing historical and comparative procedures. Prerequisite: 7S:194 and consent of instructor.

7S:306 Introduction to Research in Art Education 3 s.h.
Methods of inquiry used for research in art education and related disciplines; methods of research design. Required of all Ph.D. candidates in art education. Same as 7E:306.

7S:307 Seminar: Aesthetic Education 2-3 s.h.
Theories of aesthetics as related to teaching; instructional and learning models; nature of aesthetic experience in visual and related arts; aesthetic model as it relates to other disciplines in education; review of aesthetic education programs. May be repeated. Same as 7E:307.

7S:315 M.A. Seminar: English Education arr.
Discussion of significant developments in English education from primary and collateral readings. Prerequisite: consent of instructor. Same as 8P:405.

7S:316 Seminar: Recent Developments in Literature for Adolescents arr.
Prerequisite: a basic course in literature for adolescents.

7S:335 Seminar: Mathematics Education arr.
Prerequisite: consent of instructor. Same as 7E:335.

7S:342 Seminar: Special Topics in Music Education arr.
Prerequisite: consent of instructor.

7S:343 Choral Music Workshop 1 s.h.

7S:344 Special Workshops in Music 1 s.h.

7S:345 Public School Curriculum in Physical Education 3 s.h.
In-depth treatment of major social, psychological and biological factors influencing curriculum approaches in physical education; emphasis on current trends; extensive investigative or creative projects required. Same as 27:237, 7E:237.

7S:350 Seminar: Science Education 0-2 s.h.
Discussion of completed faculty and doctoral candidates' research.

7S:351 Developing Research Problems and Prospectuses in Science Education 2 s.h.
Defining a research problem in cooperation with a staff member; preparation of the dissertation prospectus for approval by dissertation committee.

7S:367 Seminar: Current Issues in Art Education 2-3 s.h.
Analysis of literature in art education and related disciplines. Required of all M.A. and Ph.D. candidates in art education. May be repeated for credit. Same as 7E:367.

7S:368 Current Research Emphases in Science Education 2 s.h.
Review of significant on-going research programs in the field.

7S:390 Problems in Supervision 2 s.h.
Examination of roles of school personnel chiefly concerned with supervision; alternative possibilities for these roles as school structure changes; designing curriculum decision systems.

7S:391 Problems of Curriculum Planning 2-3 s.h.
Organizing and conducting programs of curriculum improvement; techniques for developing curriculum materials; includes field experience. Prerequisites: 7S:291 and consent of instructor.

7S:392 Field Service Project in Secondary Education arr.
Prerequisite: consent of instructor.

7S:393 Master's Degree Thesis arr.
Prerequisite: consent of instructor.

7S:394 Seminar: Evaluation of Schools 2 s.h.
School evaluation for teachers as well as prospective and practicing administrators; emphasis upon role of evaluation in assessing school quality and basis for planning and implementing educational improvements; includes examination of various evaluative instruments with particular emphasis on self-evaluation process.

7S:395 Educational Specialist Research in Secondary Education arr.
Prerequisite: consent of instructor.

7S:405 Seminar: Child Art and Art Education 2-3 s.h.
Analysis and evaluation of current concepts of child art and child development, perception, creativity and art education; historical development of theories of child art, child development and art education. Same as 7E:405.

7S:406 Research in Art Education arr.
Individual research under supervision; applicable to thesis preparation and to doctoral prospectus development. May be repeated for credit.

7S:407 Research: Science Education arr.
Planning of individual research projects by M.S. and Ph.D. candidates.

7S:415 Ph.D. Seminar: English Education arr.
Discussion and evaluation of recent research and theory in education as it affects English in the secondary schools. Prerequisite: consent of instructor. Same as 8P:425.

7S:442 Music Education: Advanced Observation and Lab Practice 2 s.h.
Gives Ph.D. students opportunities in planning and teaching units in college-level courses under guidance and supervision of University professors.

7S:444 Research in Music Education 3 s.h.
Prerequisite: consent of instructor.

7S:445 Social and Psychological Factors in Music Education 3 s.h.
Prerequisite: consent of instructor.

7S:490 Seminar: Research in Secondary Education 2 s.h.
Identification of problems for research and development of plans for conducting and reporting results of research activities. May be repeated once.

7S:493 Ph.D. Thesis arr.
Prerequisite: consent of instructor.

Social Foundations of Education

Coordinator: Robert Belding
Faculty: *professor* Robert Belding
associate professor William Duffy
assistant professor Gary Theisen
Degrees offered: M.A., Ph.D.

The primary purpose of this program is to prepare college instructors in the broad areas of social foundations of education. A master's degree in Social Foundations of Education is usually inadequate by itself; however, students who intend to pursue the Ph.D. in the area of social foundations of education and who enter the program without a master's degree may find it desirable to work toward this degree. Course requirements for either degree will be tailored to the individual. Courses available are listed below. Areas of study within this field are philosophy-sociology of education, history of education, comparative and international education, and sociology of education.

Admission Requirements

General requirements are those of the Graduate College for admission to a doctoral program. A personal interview with one or more members of the Social Foundation's faculty is desirable, and may be required. A social sciences, philosophy, or general humanistic undergraduate and/or graduate emphasis and two years of teaching experience or the equivalent in related work are strongly recommended. To remain in the program, the student must maintain a 3.0 overall grade-point average.

Courses

Social Foundations and Comparative Education

7F:102 History of American Education 2-3 s.h.
Our educational thinking and actions of past 350 years as they have contributed to today's schools in United States.

7F:103 European Schools 2-3 s.h.
Treatment of contemporary educational changes in five European nations; similarities and contrasts between school policies and plans in the USSR, Scandinavia, England, France, and Germany, expecially as these bear on our country.

7F:104 Education in Newly Developing Countries 2-3 s.h.
Problems and trends of education in selected areas and countries of Latin America, Africa, and Southern Asia.

7F:107 History of Education 2-3 s.h.
Ideas and actions of great educational contributors from earliest days to present; persons and movements traced, especially as they have influenced contemporary educational practice in United States.

7F:110 The Evolution of Women's Roles in Education 2-3 s.h.
Although principal focus is on the emerging roles of women in America's educational history, a running start is provided through treatment of women's education across Europe's history as well as in other areas today.

7F:117 Philosophies of Education 2-3, 5 s.h.
Introductory survey of the principal educational philosophers and philosophies that have influenced Western education; stress placed on how philosophical ideas and conflicts have served to shape educational scene.

7F:118 The Educational Romantics: School Reformers of the 1960s 1-2 s.h.
Same as 7P:118.

7F:130 Educational Sociology 2-3 s.h.
Macro-sociological perspective of the role of education in social systems; impact of formal education on social stratification, social mobility and economic achievement in the U.S. and selected countries. Same as 34:156.

7F:135 John Dewey and Education 2-3 s.h.
Dewey's philosophy of "instrumentalism" with particular emphasis on his theories of knowledge, valuation and aesthetics, especially as applied to educational theory and practices.

7F:140 Sex Role Stereotyping and Socialization in Education 2-3 s.h.
Consideration of the part education plays in socialization of sexes; analysis of schools' reinforcement of sexual stereotyping and discussion of alternative educational approaches and strategies for change. Same as 7C:140.

7F:152 Sociology of Teaching arr.
Emphasis on nonpedagogical aspects of teaching; examination of social and psychological backgrounds of teachers and how they define and influence perception of the teacher's role; investigation of noncognitive outcomes of teacher-student interactions.

7F:154 Education, Race and Ethnicity arr.
The role of education in ethnic and racial stratification in the U.S. and other nations; investigation of the influence of variations in the family structure, stratification patterns and institutional constraints in the formation of educational aspirations and achievement levels. Same as 34:154.

7F:157 Micro Sociology of Education arr.
Analysis of social-psychological aspects of classroom socialization, interactions, and determinants of educational aspirations and achievement; emphasis on noncognitive outcomes of formal schooling. Same as 34:157.

7F:160 US Educational System and Society 2-3 s.h.
Designed to familiarize the student with the structure and characteristics of the U.S. educational system; primarily for students unfamiliar with the organization and social/cultural background of formal education in the U.S. Visits arranged to various educational institutions.

7F:210 Education and Social Change arr.
Focus on the role of educational institutions in connection with political and economic structures in the process of social change; illumination of theories of social change through case studies of educational systems in both the less-developed and industrialized nations. Same as 34:256.

7F:240 Topics in Social Foundations of Education 3 s.h.
Seminar to concentrate on intensive study of a single problem, issue or position field. May be repeated for credit. Prerequisite: consent of instructor.

7F:293 Individual Instruction in Social Foundations of Education arr.
Prerequisite: consent of instructor.

7F:302 Seminar: Social Philosophies and American Higher Education 2 s.h.
Comparison and analysis of competing social philosophies, theoretical bases and practical influence on contemporary higher education. Prerequisite: consent of instructor.

7F:304 American Contribution to Educational Philosophy 2 s.h.
American philosophy and its influence on American public education.

7F:306 Chinese and Other Communist Educational Systems 2-3 s.h.
Present status, trends, and problems among schools in 12 communist nations contrasted; Soviet Union and People's Republic of China serve as base for consideration of variations on communist educational themes from Yugoslavia to Outer Mongolia and from Cuba to Albania.

7F:380 Seminar: Value Problems in the Administration of American Education 3 s.h.
Philosophical and sociological ideas which underlie American system for administration of public education; investigation of various ideas as to place of both conformity and dissent in democratic society and democratic educational system; contemporary issues used to provide focus for examination of these ideas. Same as 7D:380.

7F:410 Seminar: Alternative Research Strategies 3 s.h.
Introduction to problem definition and hypothesis formation; survey of qualitative and quantitative research techniques and matching of methodology and theory; students bring a methodology of their choice to bear on a common research topic. Open only to students at the proposal-writing stage.

7F:493 Ph.D. Thesis arr.
Prerequisite: consent of instructor.

Interdisciplinary Courses

7X:103 Facilitating Career Development in Schools 3-4 s.h.
Conceptual frameworks for understanding work with emphasis on job analysis, and a wide spectrum of individual careers; review of career information methods and use of community resources with applications. Fall and summer.

7X:180 Workshop: The Arts in Education 1 s.h.
Designed to involve participants in various art forms, with goal of delineating common concepts which transcend various art forms while recognizing differences; emphasis on integration of art forms and presentation of strategies which can be used in the classroom.

7X:301 Current Issues in Education 2-3 s.h.
Seminar to explore implications for educational practice of recent important books in field; participants formulate reactions to readings to share in group discussion; seminar designed to provide opportunity for exchange of ideas among students and faculty from all divisions in College of Education.

7X:310 Seminar: Assessment in the Arts arr.
Interdisciplinary graduate student-faculty seminar to consider the nature and purposes of arts education and problems and means of assessment in the arts.
Prerequisite: consent of instructor.

Special Education

Chair: Alan R. Frank
Faculty: *professors* Clifford E. Howe, Paul M. Ratish
professor emeritus Raymond R. Rambolt
associate professors Louis F. Brown, Alan R. Frank, Alfred Healy, John Kiraly, Jr., Archie J. McKinnon, Kathryn C. Gerken
lecturers Dennis Corwin, Gail Fitzgerald, Austin Mueller

Undergraduate Programs

The Division of Special Education expects its graduates will continue to find opportunities as teachers of special classes in the public schools or as consultants and resource persons for teachers working with handicapped children in regular classrooms. Opportunities in the latter area reflect the trend in special education toward the accommodation of handicapped children in regular classrooms with supplemental help rather than the segregation of handicapped children in special classes.

The Iowa program in special education aims to give the student a knowledge of the characteristics of exceptional children, education programs currently provided for exceptional children and methods of teaching exceptional children.

Forty-five students are admitted to the introductory courses in special education each year. Admission decisions are based on documented experience with handicapped persons as well as total cumulative grade-point average in college coursework. Students are notified by mail about June 15 regarding their admission to the program for the coming fall term. The program is established to begin in the fall of the sophomore year and is a three-year sequence.

A student majoring in special education has three options: to qualify for approval to teach the mentally retarded at the elementary level (approval number 81); approval to teach the mentally retarded at the secondary level (approval number 81, endorsement number 20); or approval to teach the physically disabled at the elementary level (approval number 84). Both elementary programs require that the student also complete the requirements for certification in elementary education (endorsement number 10). At the secondary level the student must complete the regular secondary education foundations program and complete the major in special education, including student teaching with the mentally retarded at the secondary level.

Students interested in teaching preschool handicapped must complete a major in Early Childhood Education and an area of concentration in preschool handicapped. Persons wanting to complete this area of concentration must inform the Division of Special Education, in writing, of their intent to do so.

The program is enriched by team teaching, guest lectures, field trips, simulated teaching experiences, the use of observation techniques, practicum experiences and extensive use of media.

Program Requirements

Special Core Requirement: Natural Science

Students majoring in Early Childhood, Elementary, or Special Education should complete the special Science-Mathematics Foundation designed for them. Completion of this core requirement is a prerequisite to enrolling in 7E:162 Methods: Elementary

School Science and 7E:163 Methods: Elementary School Mathematics. This prerequisite may be satisfied in one of three ways:

Satisfactory completion of 97:55-56 and 22M:80;
Satisfactory completion of equivalent courses at another four-year approved college or university; or
Prior completion of 8 s.h. of other science and/or mathematics courses which satisfy the College of Liberal Arts core requirement, and passage of special tests dealing with the content of 97:55-56 and 22M:80.

Students not passing the science examination must successfully complete 97:104; students not passing the mathematics examination must successfully complete 22M:80.

Elementary Mental Retardation Program

7U:130 Exceptional Children	3 s.h.
7U:135 Mental Retardation	3 s.h.
7U:30 Introduction to Services for Handicapped	1 s.h.
7U:32 Instructional Methods and Procedures in Special Education I	3 s.h.
7U:33 Instructional Methods and Procedures in Special Education II	3 s.h.
7U:35 Methods Practicum in Special Education	2 s.h.
7U:136 The Trainable and Subtrainable Mentally Retarded Child	2-3 s.h.
7U:192 Laboratory Practice in Education of the Mentally Retarded Child	7 s.h.

Elementary Physical Disabilities Program

7U:130 Exceptional Children	3 s.h.
7U:139 Orientation to Rehabilitation of Physically Handicapped Child	3 s.h.
7U:30 Introduction to Services for Handicapped	1 s.h.
3:15 Introduction to Speech and Hearing Processes and Disorders	3 s.h.
7U:32 Instructional Methods and Procedures in Special Education I	3 s.h.
7U:138 Methods of Teaching Physically Handicapped	3 s.h.
7U:35 Methods Practicum in Special Education	2 s.h.
7U:191 Laboratory Practice in Education of the Physically Handicapped Child	7 s.h.

Secondary Mental Retardation Program

7U:130 Exceptional Children	3 s.h.
7U:135 Mental Retardation	3 s.h.
7U:30 Introduction to Services for the Handicapped	1 s.h.
7U:32 Instructional Methods and Procedures in Special Education I	3 s.h.
7U:33 Instructional Methods and Procedures in Special Education II	3 s.h.
Two semesters of:	
7U:35 Methods Practicum in Special Education	2 s.h.
Other required coursework:	
7P:75 Educational Psychology and Measurement	3 s.h.
7S:100 Introduction to Secondary School Teaching	2 s.h.
7P:170 Introduction to Psychology of Reading	3-4 s.h.
7W:91 Audiovisual Equipment for Instruction	1 s.h.
7W:103 Selection and Use of Media for Instruction	2 s.h.
34:1 Introduction to Sociology: Principles	4 s.h.
34:140 Criminology	3 s.h.
or	
34:141 Juvenile Delinquency	3 s.h.
7U:192 Laboratory Practice in Education of the Mentally Retarded Child	15 s.h.

Graduate Programs

Graduate programs are offered in elementary and secondary learning and emotional disabilities, school psychology, work-study coordination, administration of special education and teacher education.

General Admission Requirements

All applications are reviewed by an admissions committee of the Division of Special Education.

The following are required for admission to any of the graduate programs in the Division of Special Education:

A minimum grade-point average of 2.50 for admission to master's and Education Specialist degree program, 2.70 for doctoral work;
Completion of the Graduate Record Examination (Aptitude Test) before being admitted to the program (combined scores of 1000 or above are preferred);
Ability to work with children and youth (see specific requirements in each program area); and
Letters of recommendation documenting the ability to work with children and youth (see specific requirements in each program area), successful interpersonal relationships in employment situations, and potential for success as a graduate student.

School psychology students should note that March 1 is the deadline for the receipt of all application materials (application form, official transcripts, official GRE scores, letters of recommendation, and statement of purpose for entering program). No more than 10 students are accepted in the school psychology program each year.

M.A. Program (nonthesis)

Minimum total semester hours required: 38

Purpose: To prepare teachers to implement a wide range of educational plans to assist the exceptional child in school, to function as resource teachers, itinerant teachers and teachers in self-contained classrooms. Successful completion of this program qualifies the person for recommendation for certification in teaching the emotionally disabled or the learning disabled.

Admission requirements: See general admission requirements above. Students must be eligible for certification in elementary education (Iowa Endorsement 10); or secondary education (Iowa Endorsement 20) prior to being admitted to the program. It is preferred that candidates have one or more years of teaching experience. A list of required courses is available from the Division of Special Education office.

Ed.S. Program with Emphasis in Special Education

Minimum total semester hours required: 60

Purpose: To provide advanced graduate training for professionals in the field of special education. This may include individuals in consultation, supervisory work and work-study coordination in special education.

Admission requirements: See general admission requirements above. Additional requirements include a master's degree in Special Education or equivalent; preparation and certification in special education; and a minimum of one year full-time teaching experience before admission to the program.

Ed.S. Program with Emphasis in Special Education Administration

Minimum total semester hours required: 60

Purpose: To provide sufficient training and experience to enable graduates to be competent directors of local, regional and state special education programs. Successful completion of the program qualifies the person for certification in Iowa to serve as a director of special education (Iowa Endorsement 46); students are encouraged to complete sufficient coursework in general school administration to qualify for the superintendent's credential.

Admission requirements: See general admission requirements above. Additional requirements include a master's degree or its equivalent; preparation and certification in at least one of the areas of special education; and teaching or related relevant experience with exceptional children. A minimum GRE (Aptitude Test) score in excess of 1000 is preferred.

Ed.S. Program with Emphasis in School Psychology

Minimum total semester hours required: 60

Purpose: To provide the necessary coursework and internship training in the areas of education and psychology; to enable graduates to be competent school psychologists. Successful completion of the program qualifies the person for certification in Iowa (endorsement number 40) to serve as a school psychologist, providing the graduate of the program has had two years of successful teaching experience; otherwise, temporary certification is granted until two years of successful performance as a school psychologist have been completed.

Admission requirements: See general admission requirements above. The applicant must also have work experience which demonstrates an interest in children and/or adolescents and demonstrates the ability to work with them individually and in groups; the experience must be verified by letters of reference and evaluation. A 3.0 grade-point average on previous degree coursework is preferred.

Ph.D. Program

Minimum total semester hours required: 90

Purpose: To prepare students as consultants, school psychologists, directors of special education and university teacher trainers. The program permits students to study and practice more extensively in their area of interest in special education.

Admission requirements: See general admission requirements above. Additional requirements include a master's degree or equivalent; a minimum of one year full-time teaching experience with exceptional children in all areas except school psychology; and a statement indicating the student's perceived training needs.

Special Facilities

Special facilities available to students in Special Education include the University Hospital School (for mentally and physically disabled) and the University Psychiatric Hospital/Child Psychiatry Program (for children and youth with behavior disorders).

Financial Aid

A limited number of teaching and research assistantships are available to full-time students in M.A., Ed.S. and Ph.D. programs. The Janet Zober Memorial Tuition Stipend is available to an upper-division or undergraduate student in the training program for teachers of the physically handicapped.

Courses

7U:30 Introduction to Services for Handicapped 1 s.h.
Student is required to prepare a written summary of services located in the home geographic area which are available to the handicapped and their families.

7U:32 Instructional Methods and Procedures in Special Education I 3 s.h.
Current issues in education of the handicapped; development of IEPs for handicapped; assessment and program development in reading and math. Fall. Prerequisites: 7U:30, 7U:130, 7U:135 or 7U:139 and admission to Teacher Education Program in Special Education.

7U:33 Instructional Methods and Procedures in Special Education II 3 s.h.
Assessment and program development in social learning and language arts; skill development in classroom management and communicating with parents. Spring. Prerequisite: 7U:32.

7U:35 Methods Practicum in Special Education 2 s.h.
Involves applying knowledge gained in lectures to actual teaching situations. Restricted to majors in special education. Taken concurrently with 7U:32 and 7U:33.

7U:120 Methods of Teaching Preschool Handicapped 3 s.h.
Focus on working with children with a variety of handicapping conditions in developmental preschool programs. Spring. Prerequisites: 7U:130, 7U:135, 7U:139.

7U:130 Exceptional Children 3 s.h.
Survey of exceptional children and school programs; for transfer students and nonmajors in special education. Same as 31:117.

7U:131 Introduction to Learning Disabilities 3 s.h.
Broad examination of the field's status, history, theory, definitions, teaching approaches, programs, and unique topics of elementary and secondary school-age students.

7U:132 Introduction to Emotional Disabilities 3 s.h.
Explores developmental issues, definitional constructs, history and problems of classification, origins of disorders, basic program approaches, school placement, and programming for elementary and secondary students.

7U:133 The Culturally Different in Educational Settings 3 s.h.
Problems in teaching culturally different children of school age; relevant research on impact of disadvantaged background on learning potentials of students. Spring, summer. Same as 7C:133.

7U:135 Mental Retardation 3 s.h.
Mentally retarded child and his or her problems; causes, diagnosis and psychological problems of the retarded; principles, factors and conditions in learning of educable mentally retarded in public school setting. Spring, summer.

7U:136 The Trainable and Subtrainable Mentally Retarded Child 2-3 s.h.
Selection of pupils, organization of program, management of trainable child; curriculum content; specific materials and methods for instructing trainable children. Prerequisite: consent of instructor.

7U:137 Education of the Gifted 2-3 s.h.
Those participating will be able to demonstrate, as specified by the instructor, knowledge base of history of and programs for gifted, methodology and techniques for providing an adequate educational environment for gifted, techniques for evaluating progress of gifted. For those interested in educational processes and procedures for gifted individuals.

7U:138 Methods of Teaching Physically Handicapped 3 s.h.
Discussion of special techniques and adaptations needed when working with physically disabled children; skill development in classroom management, communicating with parents, and counseling physically disabled. Spring. Prerequisite: 7U:32.

7U:139 Orientation to Rehabilitation of the Physically Handicapped Child 3 s.h.
Medical, therapeutic and educational aspects; several professions involved in evaluation, treatment and general management of handicapped children; nature of various handicapping conditions, causes and special considerations of each. Fall, summer.

7U:140 Topical Workshop in Special Education arr.
Summer.

7U:191 Laboratory Practice in Education of the Physically Handicapped Child arr.
Student teaching with physically handicapped. Prerequisite: consent of instructor.

7U:192 Laboratory Practice in Education of the Mentally Retarded Child arr.
Student teaching with the mentally retarded. Prerequisite: consent of instructor.

7U:193 Lab Practice in Education of Preschool Handicapped Children 7 s.h.
Student teaching with preschool handicapped. Prerequisite: consent of instructor.

7U:199 Individual Instruction in Special Education: Undergraduate arr.
Prerequisite: consent of instructor.

7U:200 Educational Programming for Exceptional Persons arr.
A generic methods course; topics include P.L. 94-142, development of IEPs, assessment strategies, behavioral objectives, task and error analysis, and program evaluation. Fall, summer. Prerequisite: special education major. Pre- or corequisite: 7U:131 or 7U:132.

7U:201 Methods of Teaching Elementary Age Learning Disabled 3 s.h.
Discussion of methods and materials appropriate for use with children with various types and degrees of learning disabilities. Spring. Prerequisite: 7U:200.

7U:202 Methods of Teaching Elementary Age Emotionally Disabled Students 3 s.h.
Managing behavior for academic and affective learning; instructional resources; consultation with parents and peers.

7U:203 Methods of Teaching Secondary Age Learning Disabled 3 s.h.
Spring. Prerequisite: 7U:200.

7U:204 Methods of Teaching Secondary Age Emotionally Disabled 3 s.h.
Spring. Prerequisite: 7U:200.

7U:205 Classroom Intervention Strategies with Emotionally Disabled 3 s.h.
Uses child developmental levels and classroom observation techniques as a background for emphasis on classroom behavior intervention for all teachers as well as interventions specific to teachers of emotionally disabled students. Spring. Prerequisites: 7U:132 and consent of instructor.

7U:206 Practicum with Exceptional Persons arr.
A generic practicum experience aimed at familiarizing students with a variety of educational settings for the handicapped. Prerequisites: special education major and consent of instructor.

7U:207 Practicum with Learning Disabled arr.
Student teaching experience with learning disabled at appropriate (elementary or secondary) level. Prerequisites: special education major and consent of instructor.

7U:208 Practicum with Emotionally Disabled arr.
Student teaching experience with emotionally disabled at appropriate (elementary or secondary) age level. Prerequisites: special education major and consent of instructor.

7U:209 Seminar: Practicum Learning Disabled/Emotionally Disabled 1 s.h.
For students enrolled in student teaching practicum in learning disabilities or emotional disabilities. Corequisite: 7U:207 or 7U:208. Prerequisites: special education major and consent of instructor.

7U:210 Job Exploration for Exceptional Persons 3 s.h.
Explores curriculum, programs, and delivery systems which help handicapped individuals become employable; develops curriculum, techniques of job and task analysis, agencies which are designated to assist the handicapped worker. Field trips to work stations and job training sites are required. Spring, summer.

7U:230 Advanced Problems in Psychology of Exceptional Children arr.
Current psychological techniques in interviewing and evaluating exceptional children.

7U:236 Administration and Supervision of Special Education 3 s.h.
For directors of special education and school administrative personnel. Fall.

7U:237 Practicum in School Psychological Services arr.
Supervised practicum in psychological and educational evaluation in school settings. May be repeated. Prerequisites: 7U:238, 7U:243, 7U:251 and consent of instructor.

7U:238 Assessment and Remediation of Learning Difficulties 3-4 s.h.
Administration of individual educational assessment instruments and interpretation of test results; supervised practice in assessment and planning. Prerequisites: 7P:143, 7P:150 and consent of instructor.

7U:243 Behavioral/Personality Assessment of the School-Age Child 3 s.h.
Understanding of the variables that influence a child's behavior; special emphasis on the use of behavior rating scales, objective and projective personality tests. Fall. Prerequisite: consent of instructor.

7U:251 Individual Intelligence Testing 3-4 s.h.
Administration of individual intelligence tests and interpretation of test results; issues in psychological testing; factors which influence performance. Fall. Prerequisite: 7P:143, 7P:150 or consent of instructor.

7U:252 Integration of Assessment Information 3 s.h.
Supervised practice in the integration of educational, psychological, social, and medical information into written reports; students expected to work with children and adolescents to obtain the above information and present complete case studies in class. Prerequisites: 7U:238, 7U:243, 7U:251, 7P:273 and consent of instructor.

7U:292 Advanced Laboratory Practice with Exceptional Children arr.
Observation, experimentation and individual instruction pertaining to problems of teaching, guidance and administration; evaluation, construction and application of curriculum materials for exceptional children. Prerequisite: consent of instructor.

7U:293 Individual Instruction in Special Education arr.
Prerequisite: consent of instructor.

7U:308 Seminar: Advanced Problems in Teacher Education for Prospective Teachers of Exceptional Children arr.
Perspective on problems dealing with program designs; program goals, methods, experiences and evaluation practices; recruitment; selection; certification; accreditation; practice processes. Prerequisite: consent of instructor.

7U:338 Seminar: Current Issues in School Psychology 2 s.h.
Restricted to Ed.S. and Ph.D. students. Prerequisite: consent of instructor.

7U:344 Seminar: Research Practicum in Special Education arr.
Areas of needed research in special education; design of small-scale research projects; particular attention to planning, managing and reporting research; students assigned to current projects for practicum experience in research. Prerequisite: consent of instructor.

7U:366 Seminar: Program Development in Special Education arr.
Prerequisite: consent of instructor.

7U:367 Seminar: Current Issues in Special Education Administration arr.
Spring. Prerequisites: 7U:236 and consent of instructor.

7U:380 Practicum in College Teaching arr.
Prerequisite: consent of instructor.

7U:390 Supervision of School Psychology Practicum arr.
Doctoral students gain experience supervising school psychology practicum students. Prerequisite: consent of instructor.

7U:392 Field Service Project in Special Education Internship arr.
Prerequisite: consent of instructor.

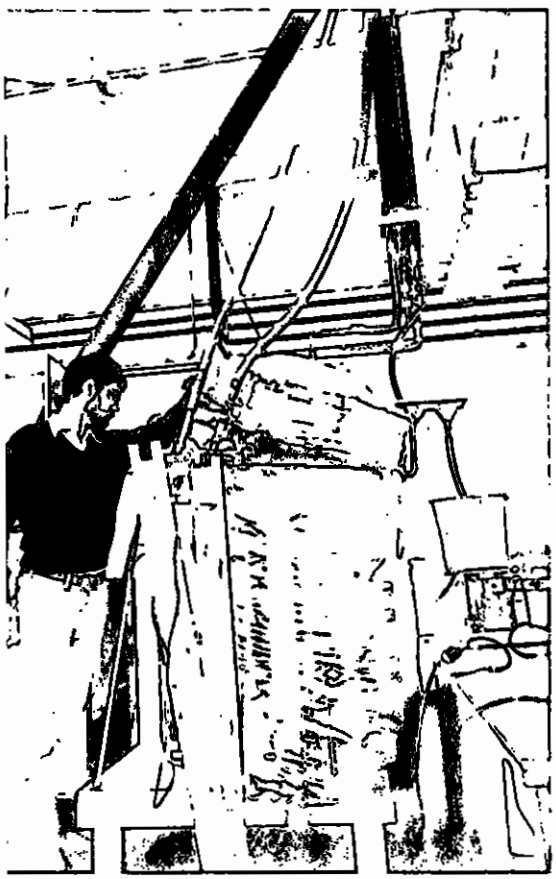
7U:393 M.A. Thesis in Special Education arr.
Prerequisite: consent of instructor.

7U:395 Educational Specialist Research arr.
Prerequisite: consent of instructor.

7U:493 Ph.D. Thesis in Special Education arr.
Prerequisite: consent of instructor.

7U:494 Ph.D. Thesis in School Psychology arr.
Prerequisite: consent of instructor.

College of Engineering



Dean: Robert G. Hering
Associate dean, undergraduate programs and student affairs: George M. Lance
Associate dean, graduate programs and research: Kwan Rim
Director, Institute of Hydraulic Research: John F. Kennedy
Coordinator, Engineering Placement and Special Projects: Thomas Farrell
Degrees offered: B.S.E., B.S.C.H., B.S.C.E., B.S.E.E., B.S.I.E., B.S.M.E.

Engineering is the profession in which a knowledge of the mathematical and natural sciences is applied to develop ways to economically utilize the materials and forces of nature for the benefit of mankind. The major aim of engineering is the creation of a new process, product, material or system that is useful to our society. This activity demands a high degree of creativity coupled with broad knowledge, good judgement and a practical sense of economics.

The College of Engineering prepares young men and women for one or more of the many career opportunities in the engineering profession. Such opportunities include positions in design, production, development, research, management and consulting. Engineers are employed in industrial organizations, governmental agencies and in private practice.

The College of Engineering has two major responsibilities. The first is the responsibility for the undergraduate engineering curricula, laboratories, counseling and other aspects of the undergraduate engineering programs. The second responsibility is the graduate programs leading to the M.S. and Ph.D. degrees in modern areas of engineering. Education at the graduate level includes extensive activities in creative research and design in laboratories of the College by faculty members and graduate students.

Programs Offered

The College of Engineering offers curricular programs leading to the Bachelor of Science, Master of Science and Doctor of Philosophy degrees in the professional fields of chemical engineering, civil engineering, electrical engineering, industrial and management engineering, and mechanical engineering.

The College also offers an undergraduate program leading to the Bachelor of Science degree in engineering for those students whose career objectives cannot be met by the professional programs; typical of such opportunities is the biomedical engineering program.

Any of the undergraduate programs offered by the College of Engineering may be combined, in a five-year option, with a program leading to the Bachelor of Arts degree in the College of Liberal Arts.

The undergraduate programs in Chemical, Civil, Electrical, Industrial, and Mechanical Engineering are accredited by the Engineers Council for Professional Development.

Organization of the College

Extraordinary demands have been imposed on the engineering profession in general and on engineering education in particular by the broadening spectrum of activities in which the engineer practices and the increasing complexities of technology. The College has responded to these demands by departing from the traditional pattern of organizational structure of engineering colleges. The College of Engineering has organized its faculty and facilities into different types of administrative units—academic programs, divisions and an institute.

The academic program units are identified as Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, Engineering, Industrial Engineering, and Mechanical Engineering.

Each program unit consists of faculty who have a major interest in and are responsible for the area represented by the curriculum. The faculty are responsible for design of curricula at all degree levels; for counseling of undergraduate and graduate students, and for all other matters affecting the individual student and his or her academic program. The chief administrative officer of a program is the program chair.

The divisions are identified as Energy Engineering, Information Engineering, Materials Engineering, and Systems Engineering. These units are the basic operating units of the College and consist of faculty and facilities organized according to broad functional areas of modern engineering endeavor. Each division is responsible for the development and operation of all laboratories at all levels of activity and for all purposes; for the content, teaching, and scheduling of all academic courses; and for the conduct of all research programs. The

chief administrative officer of a division is the division chair.

This grouping of resources according to broad functional areas combined with strong formal curricular programs provides clear insight for the student of the interdisciplinary nature of modern engineering while he is engaged in formal academic studies. Additionally, this functional arrangement broadens the educational scope of the College and encourages interdisciplinary and innovative programs.

Iowa Institute of Hydraulic Research

The Iowa Institute of Hydraulic Research (IIHR) is the third basic unit of the College. The Institute is widely acknowledged to be one of the world's leading organizations in the areas of basic and applied fluids research.

The Institute conducts programs of fundamental research and advanced design and analysis in the areas of environmental pollution, bioengineering, naval hydrodynamics, river mechanics, ice hydraulics, hydrology, water resources, hydraulic structures, fluid mechanics, and advanced instrumentation and data handling techniques for fluids research.

Direct student participation in all research and consulting activities is one of the hallmarks of the Institute's operation.

College Facilities

The Engineering Library

The Engineering Library is a center of College activity. Its collection includes 45,000 books and 750 periodicals. It is equipped with microfilm and microfiche readers.

Computer Services

Services of the University Computer Center are used extensively by students and faculty of the College, under the auspices of the College computer committee. The College itself maintains remote terminals for conversational access to the University computer and key-punch equipment in the CBE Laboratory.

Computer Based Education (CBE) Laboratory

The Computer Based Education Laboratory provides on-line interaction with the University's IBM 360-65 and HP-2000 computer systems via video display and hard copy terminals. The laboratory also contains other commonly used computer accessory equipment such as key punches and line printers, as well as video equipment for instructional purposes.

Placement Services

Students and alumni can avail themselves of the placement services provided by the College of Engineering. Interview rooms and a placement library of informational material are located in the Engineering Building. Assistance is.available for arranging interviews and obtaining information on job opportunities.

Undergraduate Programs

Degree Requirements

The Bachelor of Science degree in engineering requires a minimum of 128 semester hours of credit including satisfaction of the specific requirements of the major program as described in following sections. The candidate must be enrolled in the College of Engineering for at least the last 30 semester hours or 45 of the last 60 semester hours and must have a minimum GPA of 2.0 on all college work used to satisfy the degree requirement and on all work undertaken at The University of Iowa.

Curricular Structure

The undergraduate programs in Engineering at Iowa are designed to provide the student with a strong background in those fundamental areas upon which all engineering is based, substantial depth in the branch of engineering chosen for specialization, and sufficient background in the social sciences and humanities to appreciate the societal implications of engineering projects.

The curriculum consists of four stems extending through the entire four years of undergraduate study. The stems are mathematics, basic and applied sciences, socio-humanistic studies, and analysis and design. The mathematics, basic and applied sciences, and socio-humanistic studies courses develop the background required for engineers. The practice of engineering involves the utilization of this education to design practical solutions to real problems. This ability is developed in the analysis and design stem. The course sequence begins with Introduction to Engineering in the first semester of the freshman year and terminates with senior-level design courses during the final year.

The program curricula are based upon a core program composed of courses which are basic to all engineering and upon which all engineering programs draw. The courses involved consist of mathematics, chemistry, physics and rhetoric, in addition to engineering courses, and constitute approximately one-half of the total curriculum.

In addition to core courses and the socio-humanistic elective sequence, each program specifies a group of courses which are required of students majoring in that program. These courses provide the common background which the faculty expects of every graduate.

The remaining courses are technical electives chosen by the student in consultation with an academic adviser. These courses allow the student to develop additional depth in areas of special interest, and are ordinarily taken at the senior level. The philosophy of a core program permits the first semester to be entirely common and the first three semesters to be arranged so that a student may follow any program major, transfer between majors, or not declare a major during this period with only minor adjustments in schedule. This gives ample time before declaring a major to become familiar enough with the various programs to choose the major which best fits his or her interests.

The curriculum for the freshman year is:

First Semester

4:13 Principles of Chemistry I	3 s.h.
10:1 Rhetoric	4 s.h.
or	
10:3 Rhetoric	4 s.h.
22M:35 Engineering Calculus I	4 s.h.
580:1 Introduction to Engineering	2 s.h.
580:3 Engineering Graphics	2 s.h.
Total	15 s.h.

Second Semester

4:16 Elementary Chemistry Laboratory I	2 s.h.

10:2 Rhetoric	4 s.h.
or free elective	3 s.h.
22M:36 Engineering Calculus II	4 s.h.
580:4 Engineering Computations	3 s.h.
560:7 Statics	2 s.h.
Total	14 s.h.

A maximum of 7 s.h. is allocated to satifaction of the rhetoric requirement. Students who qualify for 10:3 will be allowed 3 s.h. of free elective, while those taking the 8 s.h. sequence of 10:1-2 may apply only 7 s.h. toward their engineering program.

The courses listed above are required of all students in engineering. 4:14 Principles of Chemistry II is recommended during the second semester for students who have chosen biomedical or chemical and materials engineering majors.

Socio-Humanistic Stem

The goal of the socio-humanistic stem is to provide more effective preparation for professional responsibilities by integrating humanities and social sciences into the undergraduate engineering curriculum.

Supportive of this goal, the student is to select, with the adviser's approval, a minimum of 16 semester hours of socio-humanistic electives, to provide at least six hours of coursework in the social sciences and six in humanities.

The social science electives shall consist of appropriate courses from the following departments: Anthropology, Economics, Geography, Political Science, Psychology, Sociology, Journalism, and Social Work, or other departments approved by the College faculty. Students may select courses from departments not included above with the approval of the associate dean for undergraduate programs. To insure an adequate depth of knowledge in a chosen area of study, students shall select a minimum of three semester hours of advanced (100-level) coursework. This material will logically build on the background previously acquired in an elementary course.

The historical-cultural electives will consist of College of Liberal Arts core courses in the historical-cultural area and/or appropriate courses from any of the following departments and schools: American Civilization; Art and Art History; Classics; East Asian Languages and Literature; English; History; Literature, Science, and the Arts; Music; Philosophy; Religion; Linguistics; Speech and Dramatic Art; or other departments approved by the College faculty. Students may select courses from departments not included above with the approval of the associate dean for undergraduate programs. Students will select a minimum of three semester hours of advanced (100-level) coursework in the historical-cultural area to secure sufficient depth of knowledge in an elected subject of study. Language courses will not satisfy any of the historical-cultural requirements unless the courses are at or beyond the second-year level. Studio courses in art and music will not fulfill the requirement.

Classification of Students

Students in the College of Engineering are classified by the number of semester hours of credit earned and applicable to a bachelor's degree in engineering, according to the following table:

Freshman—less than 28 semester hours
Sophomore—28 to 55 semester hours
Junior—56 to 89 semester hours
Senior—90 or more semester hours

Academic Probation and Good Standing

A student enrolled in the College of Engineering who fails to attain the following minimum semester and cumulative gradepoint average based on all work taken at The University of Iowa shall be placed or continued on academic probation:

Freshman	1.70
Sophomore	1.80
Junior	1.85
Senior	1.90

A student whose semester and cumulative grade-point averages equal or exceed those appropriate to his or her classification is considered to be in good standing in the College.

A student will be removed from, or placed on, academic probation only at the end of a semester. A student will not be permitted to reregister without specific approval following two consecutive semesters on probation. A student who has not made satisfactory improvement may be dismissed from the College. A student dismissed from the College for poor scholarship may petition the associate dean for undergraduate programs for permission to reenroll after an interval of two regular semesters.

Cancellation of Registration

A student in good academic standing who cancels his or her registration during the final four weeks of a regular semester, or during the final three or two weeks of a twelve- or eight-week summer session, respectively, will not be permitted to enroll for the immediately following semester without specific approval from the associate dean for undergraduate programs.

A student on scholastic probation who cancels his or her registration at any time without good cause will be considered as having been dismissed for poor scholarship.

Cancellation cards for students enrolled in the College will be signed by the associate dean for undergraduate programs only after recommendation of the student's adviser and program chair.

Credit by Examination

Students who have acquired knowledge in subject matter areas from sources other than course registrations may be granted the opportunity to obtain credit toward graduation by examination. Conditions and limitations of this policy are established by the faculty of the College of Engineering. A student wishing to exercise this opportunity should apply to the associate dean for undergraduate programs.

Pass-Fail Option

A maximum of two courses taken on a pass-fail basis may be applied toward satisfaction of the socio-humanistic requirement. The P-F option may not be used for courses taken to satisfy the rhetoric requirement.

Second-Grade-Only Option

A student may elect to repeat a course with only the new grade being counted in his or her GPA. This option can only be elected prior to the time of completing a course for which the repeated course is prerequisite.

The option may be applied to a maximum of 16 semester hours of work. Students wishing to exercise this option should apply to the associate dean for undergraduate programs.

The Combined Program

In response to an increasing demand for engineers with strong backgrounds in the humanities, social sciences and languages, Iowa offers a combined program leading to the Bachelor of Arts degree in the College of Liberal Arts and the Bachelor of Science degree in the College of Engineering. By proper scheduling of coursework in consultation with advisers from the Colleges of Liberal Arts and Engineering, the student in the combined program can normally meet the baccalaureate degree requirements of both colleges in five academic years.

Cooperative Education Program

Cooperative education involves the integration of academic work with practical experience in an organized program. Participating students spend alternate periods in full-time academic study on campus and in full-time engineering-related employment in business, industry or government.

While the student can earn a substantial portion of college expenses during the work periods, the success of the program depends on the work experience having significant educational value as well. This is assured by careful monitoring of the work experience provided by participating employers and by matching student interest and ability to the work situation.

The insight gained by involvement in the practical application of subject matter studied in the classroom usually results in improved motivation during the study periods with a corresponding improvement in academic record. Another important aspect of the experience gained, although it is difficult to evaluate, is the increased awareness of the many nontechnical considerations involved in any engineering project.

The co-op phase ordinarily begins during or immediately following the sophomore year and continues until the beginning of the senior year. The total time for the degree program under this option is normally five years and includes at least one full year of work experience. The program is an option available to qualified students on a voluntary basis.

Admission

Freshmen

To qualify for admission to the College of Engineering as a freshman, an applicant must have:

Completed the American College Tests with a composite standard score of 24 or above and a standard score of 24 or above in mathematics;
Successfully completed at least one and one-half units of algebra, one unit of plane geometry, and one-half unit of trigonometry;
Ranked in the upper one-half of his or her high school graduating class.

High school physics and chemistry are recommended for all applicants.

Transfer Students

The applicant must submit a formal application and official transcript of all college work. Each applicant should have:

Completed at least one semester of calculus or its equivalent;
Maintained a cumulative grade-point average of at least 2.25 (C), based on a four-point marking system.

A maximum of 64 semester hours credit (or the equivalent) from a junior college will be accepted toward a baccalaureate degree.

After reviewing the records of either a freshman or transfer student applicant who does not meet minimum admission requirements, the director of admissions may admit the applicant unconditionally, admit on probation, require a summer session trial enrollment, or deny admission.

Applicants who do not meet all of the criteria for admission to the College of Engineering are automatically considered for admission to the preengineering program in the College of Liberal Arts.

Student Organizations and Activities

The College of Engineering student body is organized as the Associated Students of Engineering. This provides a mechanism for planning and carrying out activities involving the entire College such as the annual Open House, MECCA Week, and the student-faculty reception for new students. Other College-wide matters of general student interest are also handled through the A.S. of E.

Engineering students publish their own student journal, the *Hawkeye Engineer*. All positions are staffed by students, with faculty serving only in an advisory capacity.

Student branches of the American Institute of Chemical Engineers, the American Institute of Industrial Engineers, the American Society of Civil Engineers, the American Society of Mechanical Engineers and the Institute of Electrical and Electronics Engineers are active at Iowa.

The U of I chapter of Tau Beta Pi, an honorary engineering society, gives special recognition to superior students in their junior and senior years. Senior and graduate engineering students who have special ability in research are eligible for election to Sigma Xi; Phi Lambda Upsilon, honorary chemistry and chemical engineering fraternity; Chi Epsilon, honorary civil engineering fraternity; Eta Kappa Nu, honorary electrical engineering fraternity; and Pi Tau Sigma, honorary mechanical engineering fraternity, recognize the work of outstanding students in their respective fields.

Student organizations dedicated to providing support and assistance in the development of more equitable enrollments of women and minorities in the College are the Black Students in Engineering and the student chapter of the Society of Women Engineers. A local chapter of Theta Tau, a national professional engineering fraternity, is active in service to the College and draws its membership from students throughout the College.

Professional Registration

Registration as a professional engineer is governed by the laws of each state. The minimum requirements include graduation from a recognized engineering curriculum of at least four years, followed by at least four years of practical experience.

The Iowa Board of Engineering Examiners has adopted the plan of admitting College of Engineering graduates to the rating "Engineer in Training" by an examination on

engineering fundamentals given at the University near the time of graduation. Completion of registration as a "Professional Engineer" requires satisfactory completion of an advanced examination following approved professional experience.

Course Numbering System

The title of each course offered by the College of Engineering is preceded by a three-digit prefix and a three-digit suffix separated by a colon.

The first digit of the prefix is 5 which identifies the course as being offered by the College of Engineering. The second digit of the prefix identifies the division of the College which offers the course according to the correspondence presented below:

52 Energy Engineering
54 Information Engineering
56 Materials Engineering
58 Systems Engineering

The third digit of the prefix identifies the curricular program for which the division offers the course, with the correspondence between the third digit and the curricular programs as shown below:

0 Undergraduate Engineering Core Programs
1 Biomedical Engineering
2 Chemical Engineering
3 Civil Engineering
5 Electrical Engineering
6 Industrial and Management Engineering
7 Courses common to more than one program
8 Mechanical Engineering

The three-digit suffix of a course number identifies the level and type of course. Generally, the suffix numbers below 100 designate courses primarily for undergraduates, numbers 100 to 199 designate courses for undergraduates and graduates, and number 200 and above designate courses primarily for graduates. The table below provides further means of conveying information on the level and type of course:

001-009 Freshman core program courses
010-019 Sophomore core program courses
020-029 Junior core program courses
030-089 Required courses in undergraduate programs
091-094 Undergraduate professional program seminars
095-097 Contemporary topics courses for undergraduates
098 Individual investigation courses for undergraduates
101-109 Courses for which little or no engineering, science or mathematics background is required
110-189 Undergraduate elective or lower level graduate course
190 Readings courses for non-engineering majors
191-194 Seminars for undergraduates and graduates
195-197 Contemporary topics courses for undergraduates and graduates
198 Individual investigations for graduates
199 M.S. thesis research
210-289 Upper level graduate courses
291-294 Seminars for graduates
295-297 Contemporary topics courses for graduates
299 Ph.D. thesis research

The courses offered by each division are listed within each division's section by disciplinary area starting with the lowest level course and proceeding to the highest level course.

Biomedical Engineering

Program chair: Kwan Rim
Faculty: *professors* Robert C. Arzbaecher, Ching-Jen Chen, Enzo O. Macagno, Donald B. McDonald, Kwan Rim
adjunct professor Herman L. Falsetti
associate professors Donald M. Levy, Theodore F. Smith
adjunct associate professors Richard A. Brand, Tai-June Yoo
assistant professors Steve M. Collins, Roy D. Crowninshield, Youngil Youm
Degree offered: B.S.

The past two decades have seen a tremendous growth of technological activity in biology and medicine. As engineers have become increasingly involved with projects in the life and health sciences, there has been increased need for them to become more familiar with the fields of biology and medicine. Recognition of this need has led to the emergence of a new interdisciplinary engineering activity designed to bridge the gap between the life sciences and engineering— the biomedical engineering profession. The undergraduate biomedical engineering program is a curricular option offered within the Bachelor of Science program in engineering.

The curriculum outlined below is built on the foundation provided by the College of Engineering core curriculum, and has been developed to prepare students for the challenges and opportunities associated with careers in the biomedical engineering profession. Students who complete this program may pursue career opportunities in industry (the design and development of biomedical instrumentation, diagnostic aids, life support systems, prosthetic and orthotic devices, man-machine systems, etc.), or they may elect to continue their formal education in the engineering, medical or legal professions. The program has been carefully designed so that it is possible to satisfy the entrance requirements of the Graduate College and the colleges of Medicine, Dentistry and Law.

Extensive graduate-level biomedical engineering research activities within the College of Engineering have led to numerous M.S. and Ph.D. degrees. Many engineering college faculty members have joint appointments in the colleges of medicine and dentistry. Both undergraduate and graduate engineering students participate actively with college faculty members and their colleagues in the life and health sciences on projects of mutual interest.

Curriculum

Sophomore Year

First Semester

22M:37 Engineering Calculus III	4 s.h.
520:16 Thermodynamics I	4 s.h.
540:11 Dynamic Systems Analysis I	3 s.h.
560:15 Materials Science I	3 s.h.
580:10 Dynamics	3 s.h.
Total	17 s.h.

Second Semester

22M:38 Differential Equations and Linear Algebra	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
540:12 Dynamic Systems Analysis II	3 s.h.
520:20 Mechanics of Fluids and Transfer Processes	4 s.h.
Total	16 s.h.

Junior Year

First Semester

580:39 Probability and Statistics for Engineering and Physical Sciences	3 s.h.
580:21 Principles of Design I	3 s.h.
540:25 Electromagnetic Theory	4 s.h.

521:81 Elementary Bioengineering	4 s.h.
Socio-Humanistic elective	3 s.h.
561:91 Professional Seminar	0 s.h.
Total	17 s.h.

Second Semester

29:82 Physics I	3 s.h.
4:121 Organic Chemistry I	3 s.h.
580:22 Principles of Design II	3 s.h.
Technical electives	3 s.h.
Socio-Humanistic electives	4 s.h.
561:91 Professional Seminar	0 s.h.
Total	16 s.h.

Senior Year

First Semester

561:83 Biomedical Engineering Design I	3 s.h.
Technical electives	6 s.h.
Socio-Humanistic electives	6 s.h.
561:91 Professional Seminar	0 s.h.
Total	15 s.h.

Second Semester

561:84 Biomedical Engineering Design II	3 s.h.
Technical electives	9 s.h.
Socio-Humanistic electives	3 s.h.
561:91 Professional Seminar	0 s.h.
Total	15 s.h.

Each student must take at least three of the five courses listed below, plus nine additional semester hours in appropriate adviser-approved engineering, biological and/or health science related courses.

521:146 Biotransport Processes	3 s.h.
541:185 Biological Systems Analysis	3 s.h.
541:186 Biomedical Measurements	3-4 s.h.
561:154 Biomechanics	3 s.h.
561:176 Biomaterials	3 s.h.

Socio-Humanistic electives must be selected to satisfy College of Engineering policy.

Chemical and Materials Engineering

Program chair: Sun-Tak Hwang
Faculty: *professors* Sun-Tak Hwang, James O. Osburn
professor emeritus Karl Kammermeyer
associate professors Keith Beddow, Edward Mielnik, Arthur F. Vetter, Han C. Wu
Degrees offered: B.S., M.S., Ph.D.

Chemical engineering is the art and science of engineering applied to processes in which chemical reactions play a dominant role. One very important application is in the production of engineering materials from basic raw materials.

Courses which have been designed primarily for the chemical engineering program are identified by the digit 2 in the third position of the course number prefix. Course descriptions are provided in this catalog primarily within the section devoted to the Division of Materials Engineering.

Undergraduate Program

The Bachelor of Science degree program in chemical engineering prepares the student for work in design, supervision, development, or sales. The curriculum includes extensive training in chemistry, in addition to the basic engineering courses. Undergraduate students have the opportunity to work with faculty members and graduate students on significant problems.

Curriculum

Sophomore Year

First Semester

22M:37 Engineering Calculus III	4 s.h.
560:10 Dynamics	3 s.h.
540:11 Dynamic Systems Analysis I	3 s.h.
560:15 Materials Science I	3 s.h.
Socio-humanistic elective	3 s.h.
Total	16 s.h.

Second Semester

22M:38 Differential Equations and Linear Algebra	4 s.h.
540:25 Electromagnetic Theory	4 s.h.
540:12 Dynamic Systems Analysis II	3 s.h.
562:42 Process Calculations	3 s.h.
520:20 Mechanics of Fluids and Transfer Processes	4 s.h.
Total	18 s.h.

Junior Year

First Semester

4:131 Physical Chemistry I	3 s.h.
29:82 Physics I	3 s.h.
562:43 Design for Energy and Momentum Transfer	4 s.h.
580:21 Principles of Design I	3 s.h.
Technical elective	3 s.h.
562:91 Professional Seminar	0 s.h.
Total	16 s.h.

Second Semester

4:132 Physical Chemistry II	3 s.h.
4:143 Advanced Chemistry Laboratory I	3 s.h.
562:41 Chemical Engineering Thermodynamics	3 s.h.
562:44 Mass Transfer Operations	3 s.h.
Socio-humanistic elective	3 s.h.
562:91 Professional Seminar	0 s.h.
Total	15 s.h.

Senior Year

First Semester

4:121 Organic Chemistry I	3 s.h.
562:45 Chemical Reaction Kinetics	3 s.h.
562:46 Economics in Design	3 s.h.
562:47 Unit Operations Lab I	2 s.h.
Socio-humanistic elective	3 s.h.
562:91 Professional Seminar	0 s.h.
Total	14 s.h.

Second Semester

4:122 Organic Chemistry II	3 s.h.
4:141 Intermediate Chemistry Laboratory I	2 s.h.
562:48 Unit Operations Lab II	2 s.h.
562:49 Chemical Engineering Process Design	3 s.h.
Socio-humanistic electives	7 s.h.
562:91 Professional Seminar	0 s.h.
Total	17 s.h.

Socio-humanistic electives must be selected to satisfy College of Engineering policy.

Graduate Program

The programs leading to the M.S. and Ph.D. are more flexible than the undergraduate program. The emphasis is on research since most of the opportunities for graduates are in industrial research and development. About one-third of the program is devoted to a research project, and a thesis is required for each degree.

Research is currently being carried out in reaction kinetics, irreversible thermodynamics, rheology, transport phenomena, constitutive equations, particle characterization and use, and biomedical engineering. More recently the faculty have embarked on research in such interdisciplinary areas as chemomechanics and radiation and aging effects in materials.

Research can be carried out during the summer session and the independent study session, and students in neighboring cities may take courses under the College of Engineering's guided self-study plan.

In addition to fulfilling the general degree requirements outlined in the "Graduate College" section of the *Catalog*, a Ph.D. candidate will assist in teaching or faculty research during two or three semesters as part of the graduate training.

Students wishing to do graduate studies in chemical engineering should write to the chair of the program. Students who want to be admitted to the program are asked to take the GRE Advanced Examination.

Civil and Environmental Engineering

Program chair: Harrison Kane
Faculty: *professors* Dan E. Branson, Richard R. Dague, Harrison Kane, John F. Kennedy, Howard W. McCauley, Donald B. McDonald, Wayne L. Paulson, William W. Sayre *adjunct professors* Clyde M. Berry, Kenneth J. Dueker, Keith R. Long
Carver professor and dean emeritus Hunter Rouse
professor emeritus Joseph W. Howe
associate professors Jasbir S. Arora, Thomas E. Croley II, Subhash C. Jain
associate professor emeritus John J. O'Mara
assistant professors Neil B. Fisher, John L. Musterman, Jerald L. Schnoor, James W. Stoner, Jean C. Tatinclaux
adjunct assistant professors Tatsuaki Nakato, A. Jacob Odgaard
Degrees offered: B.S., M.S., Ph.D.

Civil engineering is the oldest and one of the three largest fields of engineering. It traditionally has been concerned with facilities which are both large-scale and essential to modern life. Civil engineering projects include transportation systems and their components, such as bridges, highways, public transit systems, railways, harbors, airports, seaports and even spaceports; large scale structures and office buildings to provide enclosed working and living space; environmental and hydraulic systems to provide clean water and air including filtration plants and distribution systems for municipal and industrial water supplies, waste water treatment plants, dams, levees and irrigation systems.

In fact, if something is one of a kind, large and important in the daily lives of a great many people, the chances are it was planned, designed and constructed by civil engineers.

The continuing need for these and similar projects accounts for the steady demand for civil engineers through both good and bad economic times, and the variety of tasks that the individual civil engineer is qualified to perform ensures flexibility and the capacity to adjust to shifting demands.

In planning and design, the civil engineers work with architects, landscape architects, planners, economists, financiers, sociologists, lawyers and other specialists as member of the design team. Some civil engineers work in engineering offices; others may be called upon to construct or supervise the projects they have designed. These field assignments, many of which are in remote and fascinating parts of the world, are particularly appealing to many civil engineers.

Undergraduate Program

The course of study in civil engineering builds on the College of Engineering core curriculum and is designed to give the student the broad educational background essential to modern civil engineering practice. Electives in the senior year permit greater breadth or additional concentration in such areas of specialization as structural and foundation engineering, environmental engineering, hydraulic engineering, and transportation engineering.

Curriculum

Sophomore Year

First Semester

22M:37 Engineering Calculus III	4 s.h.
520:16 Thermodynamics I	4 s.h.
540:11 Dynamic Systems Analysis I	3 s.h.
560:10 Dynamics	3 s.h.
560:15 Materials Science I	3 s.h.
Total	17 s.h.

Second Semester

22M:38 Differential Equations & Linear Algebra	4 s.h.
520:20 Mechanics of Fluids and Transfer Processes	4 s.h.
540:12 Dynamic Systems Analysis II	3 s.h.
560:19 Mechanics of Deformable Bodies	3 s.h.
Socio-humanistic elective	3 s.h.
Total	17 s.h.

Junior Year

First Semester

580:39 Probability and Statistics for Engineering and Physical Sciences	3 s.h.
540:25 Electromagnetic Theory	4 s.h.
563:91 Professional Seminar	0 s.h.
580:21 Principles of Design I	3 s.h.
*Required sequences	6-7 s.h.
Total	16-17 s.h.

Second Semester

29:82 Physics I	3 s.h.
563:91 Professional Seminar	0 s.h.
580:22 Principles of Design II	3 s.h.
*Required sequences	6-7 s.h.
Socio-humanistic elective	4 s.h.
Total	16 s.h.

Senior Year

First Semester

563:56 Soil Mechanics	3 s.h.
563:91 Professional Seminar	0 s.h.
**Design elective and/or technical elective(s)	6 s.h.
*Required sequence	3-4 s.h.
Socio-humanistic elective	3 s.h.
Total	15-16 s.h.

Second Semester

563:91 Professional Seminar	0 s.h.
**Design elective and/or technical elective(s)	7 s.h.
*Required sequence	3 s.h.
Socio-humanistic electives	6 s.h.
563:97 Senior Project	1 s.h.
Total	17 s.h.

*Two required Civil Engineering sequences are to be taken during the junior year and one during the senior year. The sequences are:

563:31 Structural Analysis I	4 s.h.
563:35 Structural Design I	3 s.h.
583:73 Transportation Engineering I	3 s.h.
583:74 Transportation Engineering II	3 s.h.
523:150 Principles of Environmental Engineering	3 s.h.
523:65 Flow Systems in Environmental Engineering	3 s.h.

*One design elective is required in the senior year. Design electives are:

First semester

523:151 Hydraulic Systems Design in Environmental Engineering	3 s.h.
563:135 Structural Design II	3 s.h.

Second Semester

523:184 Hydraulic Design	3 s.h.
583:173 Transportation Systems Design	3 s.h.

Graduate Programs

The graduate program in civil and environmental engineering offers curricula preparing students for professional careers and further study in environmental engineering, hydraulic engineering, structural and geotechnical engineering, transportation engineering and water resources.

The hydraulics and water resources curricula are assoicated with the Iowa Institute of Hydraulic Research, whose laboratory is world-renowned. The senior staff members of the Institute are professors in the program and devote about half-time to teaching. The Institute offers unique opportunities for students to participate actively in the research, analysis and design aspects of real world problems. Considerable attention is given to the use of digital computers in mathematical modeling and in the acquisition and processing of data. The water resources curriculum also has ties to the Institute of Economic Research, the Institute of Urban and Regional Research, and the colleges of Business, Law, and Liberal Arts. Courses in hydraulics and water resources are described in this catalog within the section devoted to the Division of Energy Engineering.

The environmental engineering curriculum has two basic stems, one engineering and the other applied science. This curriculum maintains a heavy emphasis on interdisciplinary research and academic activities with other programs and colleges on campus, including the Institute of Hydraulic Research, the Institute of Agricultural Medicine and Environmental Health, the Institute of Urban and Regional Planning and the colleges of Business, Law and Liberal Arts.

Coursework and research permit a general program of study or specialization in one of three areas: water quality management, air quality management or solid wastes management. Environmental engineering and science courses are described in the Division of Energy Engineering section of this *Catalog*.

The structural and geotechnical curriculum may be directed towards design, analysis, research or a combination of these. Special strengths exist in the areas of time dependent behavior of reinforced and prestressed concrete structures, optimal design of structural systems and soil behavior. Coursework and research in structural analysis, structural design, soil mechanics and foundations, and optimal design are available. Courses in these areas are described in the section of this catalog devoted to the Division of Materials Engineering.

Transportation engineering includes work in planning, design, construction and operation of transportation systems and facilities. A cooperative relationship exists with the graduate program in urban transportation offered by the Center for Urban Transportation (see "Urban Transportation"). Transportation courses are described in the Division of Systems Engineering section of this *Catalog*.

Laboratory and other facilities available in the civil and environmental engineering program are described in the Division of Energy Engineering and Division of Materials Engineering sections of this *Catalog*.

Master of Science

The Master of Science programs in civil and environmental engineering are designed to permit further concentration in the area or areas of the student's choice. Graduates are placed in advanced technical positions in industry, consulting firms, or in government, or they may continue their graduate study if qualified. Current and projected demand for M.S. graduates is excellent.

In general, the plan of study, with or without thesis, must include a minimum of 30 semester hours credit, with not more than six semester hours of credit allowed for the thesis. An additional six semester hours are required in the nonthesis environmental engineering curriculum.

Each student, with the approval of his or her adviser, develops a plan of study which satisfies special requirements of the curriculum chosen by the student.

All candidates for the degree are expected to have a minimum grade-point average near 3.0 and required to pass written and oral examinations.

Doctor of Philosophy

The doctoral degree is granted primarily on the basis of achievement, rather than on a prescribed course of study. Requirements as to semester hours of coursework vary somewhat among the various areas of specialty. The candidate will normally need at least three years of full-time work beyond the baccalaureate degree, one year of which is devoted to the preparation of a dissertaion which contributes to knowledge in the field. In some specialty areas, a qualifying examination is required during the second semester for students who have not earned an M.S. in one of the Univeristy of Iowa graduate programs in engineering.

All doctoral students are required to pass a written and oral comprehensive examination prior to formal admission to candidacy for the degree. This examination is normally taken when substantially all of the student's coursework has been completed.

A final examination, in which the candidate must successfully defend his or her dissertation, culminates the program.

Doctoral candidates are expected to maintain a grade-point average of 3.2 throughout the doctoral program. The program also cooperates in interdisciplinary doctoral programs with the Program in Applied Mathematical Sciences (see the "Division of Mathematical Sciences" section in "Liberal Arts").

Special Faculty Strengths

The American Council on Education's most recent ranking of civil engineering departments offering graduate studies placed the University of Iowa program in Civil Engineering in the top 40 of the more than 200 in the nation.

Admission

Each curriculum of the program is quite flexible, and students may be admitted from all disciplines of engineering as well as the mathematical and basic sciences.

An applicant for the master's degree program is expected to have a cumulative undergraduate grade-point average of 2.5 (A=4); usually, 3.0 is expected. For admission to candidacy for the doctorate, the minimum grade-point average is 3.2 based upon previous graduate work. Applicants whose grade-point averages are slightly lower are invited to correspond regarding admission possibility.

All applicants must meet the general admission requirements of the Graduate College (see "Graduate College").

Financial Aid

A significant number of research assistantships are available on a variety of research projects, as are a limited number of teaching assistantships and fellowships. Selection of recipients usually is based on scholastic achievement and research interest.

Electrical and Computer Engineering

Program chair: Robert C. Arzbaecher
Faculty: *professors* Robert C. Arzbaecher, Dong H. Chyung, Earl D. Eyman, John R. Glover, Adrianus Korpel, George M. Lance, Karl E. Lonngren, Sudhakar M. Reddy, John P. Robinson
professor emeritus Lawrence A. Ware
associate professors Everett D. Alton, Donald M. Levy, Nan K. Loh, Norbert R. Malik
assistant professor Steve M. Collins
Degrees offered: B.S., M.S., Ph.D.

Undergraduate Program

The undergraduate program leads to a Bachelor of Science degree in electrical engineering, with a strong emphasis on computer engineering. The curriculum deals with electronics, instrumentation, control and communications systems and computers. Electrical engineers are employed in semiconductor, aircraft, radio, television, computer and power industries. With the B.S. degree, the electrical engineer is prepared to do engineering work in design, development, manufacturing, sales, market analysis, consulting, field service and management. The employment outlook for the foreseeable future is quite favorable.

To prepare the student for the electrical engineering profession, the curriculum provides a strong background in circuits, computers, control systems, electromagnetics, communication theory, electronics and design, in addition to the basic engineering core of mathematics, engineering design, engineering science and humanities. Technical electives and advanced programs are offered in biomedical systems, computer systems, electronic circuits, signal processing, digital and control systems, applied physics, power and solid state devices.

Curriculum

Sophomore Year

First Semester

560:10 Dynamics	3 s.h.
22M:37 Engineering Calculus III	4 s.h.
520:16 Thermodynamics I	4 s.h.
560:15 Materials Science I	3 s.h.
540:11 Dynamic Systems Analysis I	3 s.h.
Total	17 s.h.

Second Semester

22M:38 Differential Equations and Linear Algebra	4 s.h.
540:25 Electromagnetic Theory	4 s.h.
545:30 Digital and Computer Systems	3 s.h.
540:12 Dynamic Systems Analysis II	3 s.h.
Socio-humanistic elective	3 s.h.
Total	17 s.h.

Junior Year

First Semester

29:82 Physics I	3 s.h.
580:39 Probability and Statistics for Engineering and Physical Sciences	3 s.h.
545:80 Principles of Electrical Engineering Design I	3 s.h.
545:40 Electronic Circuits I	3 s.h.
545:50 Communication Systems	3 s.h.
*545:91 Professional Seminar	0 s.h.
Total	15 s.h.

Second Semester

29:83 Physics II	3 s.h.
545:81 Principles of Electrical Engineering Design II	3 s.h.
545:41 Electronic Circuits II	3 s.h.
545:60 Control Systems	3 s.h.
*545:91 Professional Seminar	0 s.h.
Socio-humanistic elective	4 s.h.
Total	16 s.h.

Senior Year

First Semester

545:70 Electrical Engineering Materials and Devices	3 s.h.
545:82 Principles of Electrical Engineering Design III	3 s.h.
*545:91 Professional Seminar	0 s.h.
**Science core elective	3 s.h.
Socio-humanistic elective	3 s.h.
Technical elective	4 s.h.
Total	16 s.h.

Second Semester

545:83 Principles of Electrical Engineering Design IV	3 s.h.
*545:91 Professional Seminar	0 s.h.
Socio-humanistic electives	6 s.h.
Technical electives	9 s.h.
Total	18 s.h.

*Professional Seminar must be taken at least once in the junior year and once in the senior year.

**Science core electives:

520:20 Mechanics of Fluids and Transfer Processes	4 s.h.
560:19 Mechanics of Deformable Bodies	3 s.h.
580:27 Engineering Management Science	3 s.h.
Biological science course	

Graduate Program

The Electrical and Computer Engineering Program offers curricula leading to the Master of Science and Doctor of Philosophy degrees. Thesis and nonthesis M.S. programs are available, and either may precede Ph.D. studies.

Excellence in scholarship and research is stimulated through close contact with the faculty throughout the period of graduate study and through programs tailored to fit individual needs. Each graduate student is regarded as an important member of the program whose contributions are highly valued.

Each student selects his or her own adviser, and, with the adviser, plans an individual program, with freedom of choice bounded only by a few broad guidelines imposed by the Graduate College and by the program. Foreign languages and research tools, for example, are not required by the Graduate College or by the program, but are introduced into the program by the student and adviser to the extent that they are appropriate in light of the particular student's goals.

The program recognizes the student's desire to complete degree requirements as promptly as possible without sacrifice of quality, and encourages the student to proceed toward graduation as rapidly as possible.

The basic program, which is fundamental to electrical and computer engineering, has a wide application, and this has resulted in

interdisciplinary research in areas such as biomedical engineering, computer systems, and applied mathematics. Graduate students are encouraged to take courses in several interdisciplinary areas. Opportunities are available for the graduate student to choose his or her own interests and participate in a creative effort. Well-established and funded research laboratories exist in the following areas:

Applied Physics

Plasma physics and electro-optics investigations utilize specialized laboratories in both the Engineering Building and Physics Research Building. Typical projects involve nonlinear wave interaction, plasma instabilities, laser optics, and acoustic wave behavior.

Applications to Biology and Medicine

Computer-assisted electrophysiology, heart arrhythmia analysis, drug infusion, and other medically related computer investigations utilize another laboratory with its own real-time computer system. These projects involve close collaboration with colleagues in the College of Medicine.

Control Systems

In cooperation with outside agencies, several projects applying modern control theory are in progress. These include stability considerations, time delay, and digital implementation. In the controls laboratory, investigation of real-time digital control, nonlinear system theory, and digital estimation utilize mini- and micro-computers.

Computer Systems

Fault-tolerant subsystem design and reliable system configurations are typical project areas. Other topics include data security, data communications, networks and self-checking systems.

In cooperation with nearby industry, the program also offers off-campus courses in electrical and computer engineering.

Master of Science

Thesis and nonthesis programs are available. The degree requires at least 30 semester hours of credit in an approved, coherent program acceptable to the adviser and the graduate committee. This must include at least 12 semester hours of coursework in electrical engineering, not including courses required for electrical engineering undergraduates, and at least nine semester hours of coursework outside of electrical engineering, ordinarily from mathematics and physics.

With thesis, up to eight semester hours of the 30 semester hours may be research credit.

Without thesis, at least 3 semester hours of 547:198 Individual Investigations are required, in addition to the 12 semester hours in electrical engineering. This independent study is to be a special project completed under the supervision of the student's program adviser.

The candidate for the master's degree in electrical engineering must also successfully complete a final examination which is conducted by a committee of at least three faculty members, of which the adviser is chair. One part of the final examination must consist of an oral defense of the thesis, for thesis candidates, or of the materials in 547:198 Individual Investigations, for nonthesis candidates.

Doctor of Philosophy

Requirements other than those stated in the University's graduate manual are:

Selection of a program adviser and filing of a tentative plan of study with the Program during the first year;

At least 72 semester hours of credit in a coherent program acceptable to the adviser and approved by the graduate committee, with at least 45 semester hours of credit earned in formal courses, including 30 semester hours in courses numbered 545;

Successful completion of the Ph.D. qualifying examination;

Successful completion of the Ph.D. comprehensive examination;

Successful completion of a research program; and

Successful completion of a final oral defense of the thesis.

Financial Aid

A number of fellowships, traineeships, assistantships, scholarships and industrial grants are available to graduate students who qualify. These are awarded on a competitive basis.

Admission Requirements

The normal graduate admission requirement of the program is at least a 2.7 grade-point average on all courses in electrical engineering, mathematics and physics for M.S. students, 3.0 for Ph.D. students. An M.S. student with a grade-point average less than 2.7 but better than 2.3 on courses in electrical engineering, mathematics and physics, may be admitted on probation.

Students with baccalaureate degrees in related areas (e.g., physics, mathematics and computer sciences) may be admitted. In such cases, additional coursework without graduate credit may be required.

Each application is reviewed on an individual basis. Extenuating circumstances may permit deviations from the normal standards.

Engineering

Program chair: George M. Lance
Faculty: *professors* J. Wayne Deegan, Sun-Tak Hwang, George Lance, Howard W. McCauley
associate professor James Andrews
Degree offered: B.S.

The increasing emphasis on interdisciplinary and nontraditional career objectives emphasizes the desirability of having available a degree program which combines a strong background in engineering fundamentals with the flexibility of choosing a major elective sequence to achieve specific educational goals of individual students. The primary objective of the Bachelor of Science in Engineering program is to provide such an option for students whose specific goals cannot be achieved within the framework of any of the designated degree programs.

The breadth and depth of required engineering core courses assures a sound engineering background. The elective sequence can then be used to develop those areas of special interest to the student which lead to the choice of the undesignated engineering program.

Undergraduate Program

The objective of the undergraduate degree program is to provide the opportunity for each student to develop an individually-tailored program. However, a proper balance

between breadth and depth must be maintained in order to result in a well-balanced education. To accomplish this, the curriculum contains a strong base of engineering core courses with the remainder of the program consisting of a guided elective sequence. The specified portion of the program contains sufficient breadth and depth in fundamentals to guarantee an excellent background in engineering fundamentals.

The major portion of the elective program is scheduled for the final three semesters and builds from background acquired in the engineering core courses. This elective sequence is planned in consultation with an adviser to achieve a coordinated program which satisfies the specific objectives of the student. The sequence is selected not later than the fifth semester of study and must be approved by the Program Review Committee (PRC). The PRC is also responsible for monitoring the progress of all students in the program and offering suggestions and advice as required.

Curriculum

Sophomore Year

First Semester

22M:37 Engineering Calculus III	4 s.h.
520:16 Thermodynamics I	4 s.h.
540:11 Dynamic Systems Analysis I	3 s.h.
560:15 Materials Science I	3 s.h.
560:10 Dynamics	3 s.h.
Total	17 s.h.

Second Semester

22M:38 Differential Equations and Linear Algebra	4 s.h.
540:12 Dynamic Systems Analysis II	3 s.h.
560:19 Mechanics of Deformable Bodies	3 s.h.
540:25 Electromagnetic Theory	4 s.h.
Socio-humanistic elective	3 s.h.
Total	17 s.h.

Junior Year

First Semester

580:39 Probability and Statistics for Engineering and Physical Sciences	3 s.h.
29:82 Physics I	3 s.h.
520:20 Mechanics of Fluids and Transfer Processes	4 s.h.
580:21 Principles of Design I	3 s.h.
Socio-humanistic elective	3 s.h.
Total	16 s.h.

Second Semester

29:83 Physics II	3 s.h.
580:22 Principles of Design II	3 s.h.
580:27 Engineering Management Science	3 s.h.
Technical elective	3 s.h.
Socio-humanistic elective	4 s.h.
Total	16 s.h.

Senior Year

First Semester

Design course	3 s.h.
Technical electives	12 s.h.
Socio-humanistic elective	3 s.h.
Total	18 s.h.

Second Semester

Design course	3 s.h.
Technical electives	9 s.h.
Socio-humanistic elective	3 s.h.
Total	15 s.h.

Socio-humanistic elective courses must be selected to satisfy the College of Engineering policy.

Industrial and Management Engineering

Program chair: J.M. Littschwager
Faculty: *professors* J.W. Deegan, J.M. Littschwager, J.S. Ramberg, J.R. Simon
associate professor E.M. Mielnik
assistant professors D.L. Bricker, M. Chandra, C.R. Standridge
instructor D.R. Heitne
Degrees offered: B.S., M.S., Ph.D.

The industrial and management engineer has many opportunities for employment and service in industrial, governmental, research and public service organizations. Employment opportunities are among the most varied in the engineering field. The industrial and management engineer may hold a staff position in which he is adviser to management, or he may be in a line unit participating directly in management decisions. His job title might be operations analyst, industrial engineer, systems analyst or engineer, operations research analyst, internal consultant, supervisor or manager. He may be employed by a manufacturing firm, a government agency or by a service organization such as an airline, bank, hospital or university.

In general, the industrial and management engineer is concerned with the analysis, design and implementation of systems involving the optimal use of resources—human, material and financial. The systems involved may range from small subsystems to extremely large systems. In order to accomplish these varying activities the industrial and management engineer is skilled in mathematics, physical sciences, management and human relations, as well as in computer systems, economics, optimization and systems analysis, and design methods. Both undergraduate and graduate programs in Industrial and Management Engineering are designed to provide courses in these areas, while at the same time, offering the student an opportunity to specialize in an area of his choice.

Undergraduate Program

The undergraduate curriculum in industrial engineering requires a strong foundation of courses in management and engineering science, mathematics, design, social sciences and humanities. Advanced courses include specialty courses in manufacturing, operations research, statistics, human engineering, and digital computation. An undergraduate handbook, describing the program in greater detail, is available upon request.

Curriculum

Sophomore Year

First Semester

560:15 Materials Science I	3 s.h.
580:27 Engineering Management Science	3 s.h.
22M:37 Engineering Calculus III	4 s.h.
540:11 Dynamic Systems Analysis I	3 s.h.
560:10 Dynamics	3 s.h.
Total	16 s.h.

Second Semester

22M:38 Differential Equations and Linear Algebra	4 s.h.
540:12 Dynamic Systems Analysis II	3 s.h.
520:16 Thermodynamics I	4 s.h.
566:70 Materials Science II	3 s.h.
*Economics elective	3 s.h.
Total	17 s.h.

Junior Year

First Semester

566:71 Materials Processing I	3 s.h.
586:140 Quantitative Methods	3 s.h.
580:39 Probability and Statistics for Engineering and Physical Sciences	3 s.h.
580:21 Principles of Design I	3 s.h.
540:25 Electromagnetic Theory	4 s.h.
586:91 Professional Seminar	0 s.h.
Total	16 s.h.

Second Semester

29:82 Physics I	3 s.h.
586:141 Introduction to Operations Research	3 s.h.
**31:1 Elementary Psychology	4 s.h.
580:22 Principles of Design II	3 s.h.
*Historical-cultural elective	3 s.h.
586:91 Professional Seminar	1 s.h.
Total	17 s.h.

Senior Year

First Semester

586:129 Information Systems Design	3 s.h.
**31:156 Psychology in Management	3 s.h.
586:121 Design of Work Methods	4 s.h.
*Science core elective	3 s.h.
***Technical elective	4 s.h.
586:91 Professional Seminar	0 s.h.
Total	17 s.h.

Second Semester

**31:155 Human Engineering	3 s.h.
586:133 Quality Control, Reliability and Engineering Statistics	3 s.h.
***Technical electives	6 s.h.
*Historical-cultural elective (100-level)	3 s.h.
586:91 Professional Seminar	1 s.h.
Total	16 s.h.

*The science core elective may be selected from:

29:83 Physics II	3 s.h.
560:19 Mechanics of Deformable Bodies	3 s.h.
520:20 Mechanics of Fluids and Transfer Processes	4 s.h.
A biological science course	3 s.h.

The economics elective may be selected from:

6E:100 Price, Employment and Production Theory	4 s.h.
6B:173 Managerial Economics	3 s.h.
6E:103 Microeconomics	3 s.h.
6E:111 Labor-Manpower Economics	3 s.h.

**Strongly recommended social science electives.

***Courses satisfying technical elective requirements include:

587:101 Communication in Industry I	3 s.h.
586:124 Operational Systems Design	3 s.h.
586:128 Engineering Administration I	3 s.h.
586:142 Production Inventory Models	3 s.h.
586:143 Quantitative Investment Analysis	3 s.h.
586:147 Sequencing and Scheduling	3 s.h.
586:149 Digital Systems Simulation I	3 s.h.
586:157 Advanced Managerial Psychology	3 s.h.

Graduate Program

The goal of the Industrial and Management Engineering graduate program at both the M.S. and Ph.D. levels is to provide a modern, highly flexible curriculum of graduate studies. Each student's course of study will be based on his background, career objectives, and sound academic practice. Program faculty have research interests in areas related to engineering management and human factors; operations research, computing and engineering statistics; materials processing and transportation.

Student programs emphasizing operations research or engineering management and human factors may be developed from Division of Systems Engineering courses offered mainly by Industrial and Management Engineering program faculty. M.S. students desiring a more general program may combine these emphases at the M.S. level, while those desiring some specialization in engineering statistics, computing or materials processing may accommodate these preferences through the combination of Industrial and Management Engineering program courses and appropriate electives from other programs and departments of the university. Ph.D. student programs center either in the areas of operations research and engineering statistics or engineering management and human factors. Graduate students with special interest in law or transportation may participate in programs which are jointly administered with the College of Law and Program in Urban Transportation. A graduate handbook, describing the program in greater detail, is available upon request.

Master of Science Degree

Students may be admitted from accredited baccalaureate curricula in any engineering discipline and the mathematical or physical sciences with a minimum grade-point average of 2.50 and/or an acceptable score on the Graduate Record Examination (typically, at least 450 Verbal, 650 Quantitative). Students may be considered for conditional admission with a 2.30 grade-point average and lesser GRE scores. Students from business or social science programs who have adequate mathematical preparation may also be considered for regular or conditional admission. The student on conditional status must achieve regular status within two sessions of registration by attaining a grade-point average of at least 2.75 and regular acceptance by the Industrial and Management Engineering program faculty or be dismissed.

The minimum M.S. program requires 30 semester hours of coursework and research. Students may choose either a thesis or a nonthesis program, although research assistants may be required to write an M.S. thesis as a condition of their support. All students, however, are encouraged to obtain the master's degree with thesis. Students desiring eventual admittance to Ph.D. study are especially advised to select the thesis option. A tentative plan of study for each student is determined through consultation with his/her adviser; the final plan of study is reviewed by the student's examining committee, approved by the Industrial and Management Engineering program chair and by the Graduate College dean.

Entering students in all programs will find some background in computer programming and probability and statistics helpful. Engineering management and human factors students will find elementary psychology and engineering economics useful preparation. Compensating coursework may be required for students with nonengineering backgrounds.

To be eligible for the M.S. degree, the student is required to maintain a minimum grade-point average of 2.75 on a minimum of

30 semester hours of graduate work. The nature of the final examination will be specified by the examining committee. It may be comprised of both written and oral parts. The examination will explore further the student's course preparation and/or the student's defense of his/her thesis or appropriate individual investigation.

Doctor of Philosophy Degree

Students may be admitted from accredited baccalaureate or post-baccalaureate curricula in any engineering discipline or the mathematical and physical sciences with a minimum grade-point average of 3.00 and an acceptable score on the Graduate Record Examination (typically, at least 500 Verbal, 700 Quantitative). Students may also be admitted from business or social science programs on an individual basis. Students with a Ph.D. objective and a B.S. degree are usually first admitted to the M.S. program.

All doctoral programs in the Graduate College must contain a minimum of 72 semester hours of graduate work and include at least two semesters of residence. Typically, Ph.D. programs in Industrial and Management Engineering contain at least 90 hours of study including research for the dissertation. Part-time Ph.D. study is discouraged. There is no foreign language requirement.

Admission to degree candidacy will require a minimum grade-point average of 3.25 on all graduate work taken at The University of Iowa and the demonstration of capacity for individual achievement. Upon completion of the coursework specified by his/her adviser and examining committee with the GPA stipulated above, and upon recommendation by his/her adviser, the student will be admitted to the comprehensive examination. During this examination, which includes both written and oral parts, the student will be examined over the advanced coursework in his/her program. Part of this examination will usually include the presentation of a dissertation proposal so that the comprehensive committee can evaluate the student's academic preparation in the light of the research to be performed.

Having satisfactorily completed this examination, the student is accepted as a candidate for the Ph.D. and normally has only to complete and defend his/her dissertation.

Extension and Guided Self-Study

In cooperation with the Extension Division, program faculty will periodically offer extension classes in Cedar Rapids, Dubuque, or the Quad Cities. The program chair should be consulted for offerings in any semester. Program faculty also offer a limited guided self-study program for off-campus students.

Financial Aid

Financial support is available primarily through research and teaching assistantships. Awards are based on the student's academic record and upon an assessment of the student's potential contribution to the research and teaching goals of the program.

Mechanical Engineering

Program chair: Virendra C. Patel
Faculty: *professors* Ching-J. Chen, John R. Glover, Edward J. Haug, Robert G. Hering, George M. Lance, Louis Landweber, Enzo D. Macagno, Donald H. Madsen, Virendra C. Patel, Kwan Rim, Ralph I. Stephens, J. Merle Trummel
associate professors James G. Andrews, Jasbir S. Arora, David C. Chou, Cesar Farell, Nicolae Orlandea, Paul D. Scholz, Theodore F. Smith, Donald L. Spencer
adjunct associate professors Richard A. Brand, B.R. Ramparian, John Wiley
assistant professors Roy D. Crowninshield, Ray Chong Huang, Youngil Youm
adjunct assistant professor Arthur Glaquinta
Degrees offered: B.S., M.S., Ph.D.

In addition to providing the student with a sound preparation for entering the practice of mechanical engineering, an effort is made to provide for breadth in both technical and nontechnical areas. This is done by careful planning for each student's elective courses and by encouraging individual student projects. Areas of concentration offered for graduate study and research include thermal science, energy, mechanical systems, heat transfer, gas dynamics, solid mechanics, and the promising interdisciplinary areas of biomechanics and optimal design.

Undergraduate Program

The undergraduate program in mechanical engineering prepares the student for a career in engineering with an emphasis on the technical areas of thermal energy systems and the conversion of thermal energy to mechanical and electrical energy, mechanical systems and machines, and design and control of these systems.

The undergraduate curriculum provides a substantial number of electives in both the technical and socio-humanistic areas. In consultation with his or her adviser, a student can plan to develop capabilities to meet individual goals within the framework of the curriculum. All upperclasspersons are strongly encouraged to undertake individual projects involving either an experimental or analytical design solution to a current problem.

Curriculum

Sophomore Year

First Semester

22M:37 Engineering Calculus III	4 s.h.
560:10 Dynamics	3 s.h.
540:11 Dynamic Systems Analysis I	3 s.h.
560:15 Materials Science I	3 s.h.
520:16 Thermodynamics I	4 s.h.
Total	17 s.h.

Second Semester

22M:38 Differential Equations and Linear Algebra	4 s.h.
540:12 Dynamic Systems Analysis II	3 s.h.
540:25 Electromagnetic Theory	4 s.h.
560:19 Mechanics of Deformable Bodies	3 s.h.
Socio-humanistic elective	3 s.h.
Total	17 s.h.

Junior Year

First Semester

580:39 Probability and Statistics for Engineering and Physical Sciences	3 s.h.
29:82 Physics I	3 s.h.
580:21 Principles of Design I	3 s.h.
520:20 Mechanics of Fluids and Transfer Processes	4 s.h.
528:91 Professional Seminar	0 s.h.
Socio-humanistic elective	4 s.h.
Total	17 s.h.

Second Semester

29:83 Physics II	3 s.h.
580:22 Principles of Design II	3 s.h.
528:80 Experimental Engineering	4 s.h.
528:40 Thermodynamics II	3 s.h.

528:91 Professional Seminar	0 s.h.
Socio-humanistic elective	3 s.h.
Total	16 s.h.

Senior Year

First Semester

528:45 Heat Transfer	3 s.h.
568:52 Mechanical Systems Design I	4 s.h.
528:91 Professional Seminar	0 s.h.
Technical electives	6 s.h.
Socio-humanistic elective	3 s.h.
Total	16 s.h.

Second Semester

528:82 Mechanical Engineering Design II	3 s.h.
528:91 Professional Seminar	0 s.h.
Technical electives	10 s.h.
Socio-humanistic elective	3 s.h.
Total	16 s.h.

Graduate Program

Graduate programs leading to the Master of Science degree, both with and without thesis, and to the Doctor of Philosophy degree are available to qualified students. General degree requirements are specified in the "Graduate College" section of this *Catalog*.

Areas of concentration for graduate study include solar energy, heat transfer, thermodynamics, gas dynamics, solid mechanics, biomechanics, optimal design, and mechanical systems design. Flexibility to meet individual goals is possible within the framework of program requirements. The student and adviser plan a program of study, and the adviser also serves as the research and thesis supervisor.

The Program of Mechanical Engineering cooperates in interdisciplinary doctoral programs, particularly the program in Applied Mathematical Sciences.

Master of Science

The Master of Science degree requires a minimum of 30 semester hours of academic credits, including not more than eight semester hours of thesis work, if the thesis option is chosen. About half of the hours are specified, depending upon the area of concentration and about half the hours are selected by the student in consultation with his or her adviser.

Candidates for the degree are expected to maintain at least a 3.0 grade-point average, in addition to passing the required examinations. Students not writing theses will take both written and oral examinations; students writing theses may expect emphasis on the thesis in the required examinations.

Doctor of Philosophy

The Doctor of Philosophy degree is granted on the basis of achievement rather than on the accumulation of semester hours of credit. However, the student is normally expected to earn approximately 60 semester hours beyond the M.S. degree. About 25 semester hours are devoted to the dissertation and about 15 semester hours are devoted to mathematics or closely related areas. This leaves about 20 semester hours of major courses to be taken in the Program. This latter group will be chosen in consultation with the adviser and with consideration of the student's choice of specialty.

Doctoral candidates are expected to maintain a 3.25 grade-point average throughout their doctoral program.

Ph.D. students may be required to have one year of study of a foreign language. For this requirement, each student's program and objectives are evaluated and a recommendation is made by the student's adviser. Students from non-English-speaking countries may use their native language as well as their required competency in English to meet this requirement.

During research for and writing of their dissertation, students work closely with their thesis supervisor who usually is their academic adviser. The comprehensive examination must be taken prior to the student's last term of registration. The final examination, which is entirely on the dissertation, culminates the program.

Financial Aid

There is a considerable amount of support available for graduate students. A significant volume of research work relies on enlisting graduate students as research assistants. Also, some graduate students are employed as teaching assistants.

Admission

In addition to minimum requirements of the Graduate College, applicants for admission to a graduate program in mechanical engineering are expected to rank in the upper quarter of their college undergraduate classes.

Although graduate students in mechanical engineering will ordinarily have a baccalaureate degree in mechanical engineering or a closely related field, science and mathematics students who are interested in interdisciplinary programs will be admitted, if a careful review of their qualifications and objectives finds them suitable.

Division of Energy Engineering

Chair: Virendra C. Patel
Faculty: *professors* Ching Jen Chen, Richard R. Dague, John R. Glover, Robert G. Hering, Philip G. Hubbard, John F. Kennedy, Louis Landweber, Enzo O. Macagno, Donald H. Madsen, Donald B. McDonald, Virendra C. Patel, Wayne L. Paulson, William W. Sayre
adjunct professors Clyde M. Berry, Herman L. Falsetti, Keith R. Long
Carver Professor emeritus and dean emeritus: Hunter Rouse
professor emeritus Joseph W. Howe
associate professors David C. Chou, Thomas E. Croley II, Cesar Farell, Subhash C. Jain, Paul D. Scholz, Theodore F. Smith, Donald L. Spencer
adjunct associate professor B.R. Ramaprian
associate professor emeritus Marcus P. Powell
assistant professors Neil B. Fisher, John L. Musterman, Jerald L. Schnoor, Jean-Claude Tatinclaux
adjunct assistant professors Arthur Giaquinta, Tatsuaki Nakato, A. Jacob Odgaard

The responsibilities of the Division of Energy Engineering include the development and teaching of courses at all levels, development and maintenance of teaching and research laboratories and conduct of basic and applied research in the disciplinary fields of fluid, thermal, and environmental sciences. The Division's mission is to maintain excellence in its teaching and scholarly activities, while remaining responsive to the changing engineering needs of society and its demands upon the engineering profession.

The applications of the fundamental principles of biological, chemical, fluid, and thermal sciences to the design of engineering components and projects, to the production, distribution and utilization of water, energy, and materials, to the protection of the environment and to the ever-increasing interaction between engineering and health sciences are conveyed

to the undergraduate student through a series of integrated courses at various levels. In addition to serving students in all engineering curricula through the core program, the Division offers specialized courses for students majoring in biomedical, chemical, civil and mechanical engineering, and campus-wide general courses highlighting the complex interaction between engineering and other fields of learning in dealing with the problems of energy and environment.

At the graduate level, the Division offers courses in thermal sciences and transport phenomena, environmental sciences, fluid mechanics, hydraulic engineering and water resources for students pursuing advanced degrees in the Civil and Environmental Engineering and Mechanical Engineering programs. The diversity of the teaching and research interests of the faculty of the Division and the opportunities available to graduate students pursuing M.S. and Ph.D. thesis research under their direction are best illustrated by listing the currently active research projects.

Active Research Projects

Fluid Mechanics: Dispersion and diffusion of passive and reactive contaminants in rivers and lakes; experimental and theoretical studies of turbulent boundary layers, wakes, jets and plumes; unsteady turbulent and transitional flows; analytical and numerical solutions of problems in ship hydrodynamics; physiological flow phenomena in cardiovascular and intestinal systems; wind loads on structures; detection and removal of airborne particles.

Hydraulic Engineering: Design, modeling and on-site testing of intake and outfall structures; river management; thermal discharges into natural water bodies; cooling tower performance; sediment transport; formation of ice covers and ice jams; strength of ice; ice forces on structures.

Instrumentation: Laser and hot-wire anemometry; measurement of sediment and very-low fluid velocities; real-time acquisition and processing of data.

Thermal Sciences: Biological heat transfer; dynamics of aerocolloidal suspensions; radiant heat transfer through real gases; radiative properties of rough surfaces; remote heat-flux measurement; design, performance and heat transfer studies of solar-energy collectors and thermal-storage systems; aerodynamic heating; plasma nonequilibrium; power-plant cooling systems; economics of power production.

Water Quality: Mathematical modeling of water quality in streams and lakes; optimal allocation of resources to control water pollution; removal of trace organics in water treatment; kinetics of nitrification in streams; sludge stabilization in wastewater treatment; disposal of sludge from water and wastewater treatment; anaerobic treatment of pyrolysis gas scrubber wastes; biological reduction for the removal of sulfates from ground water; anaerobic treatment of high strength thermal sludge conditioning wastes; pilot scale evaluation of micro-screening for sludge dewatering.

Water Resources: Economics of water usage; management of reservoirs; stochastic hydrology; systems analysis; watershed modeling; water utilization by waste heat management.

Special Facilities

The laboratory for undergraduate instruction in fluid and thermal sciences is located in the Engineering Building and contains a small wind tunnel, a water table, various air, water and oil flow devices, and facilities for numerous small-scale experiments which demonstrate the principles of mass, momentum, and energy transfer. More specialized experiments are also performed in the other laboratories of the Division and with the facilities of the Iowa Institute of Hydraulic Research. Experiments in the environmental sciences are performed at the laboratories in the University Water Plant and the P.F. Morgan Sanitary Engineering Laboratory.

Since most members of the senior research staff of the Institute of Hydraulic Research hold professorial appointments in the Division of Energy Engineering, the teaching and research functions of the Division are closely connected with the research and consulting activities of the Institute. This is particularly so in the areas of fluid mechanics, hydraulic engineering, flow instrumentation, water resources and those aspects of thermal sciences related to diffusion and dispersal of waste heat in water.

The Institute houses some of the most modern research facilities in the world. The equipment includes a 330-foot towing tank, several hydraulic flumes and wind tunnels, a dispersion flume, a wave tank, a special low-temperature flow facility for investigation of ice phenomena, and an environmental hydraulic flume for modeling of atmospheric flows. A new ice flume/towing-tank is under construction. The Institute is also equipped with a computer-based data acquisition and control system for on-line recording, storage and processing of experimental data gathered at various points in the laboratory.

Research in environmental sciences and engineering is conducted in the Division's laboratories located at the Philip F. Morgan Sanitary Engineering Research Laboratory, situated on the site of the Iowa City Municipal Wastewater Treatment Plant, and in the Water Plant Laboratory, located in the University Water Treatment Plant.

The Morgan Laboratory is devoted to research activities in the wastewater treatment area. It includes a modern wet chemistry laboratory and space for bench and pilot scale studies of the physical, chemical, and biological operations and processes of wastewater treatment. Permanent pilot facilities at the Morgan Laboratory include a 10,000-gallon aeration tank, a gallon-per-minute activated sludge treatment system, and a gallon-per-minute rotating biological disc unit.

The Water Plant Laboratory is the center of research in the water treatment and natural aquatic systems area. The Laboratory is fully equipped for both routine and advanced chemical and biological analyses of water and provides space for both bench and pilot scale studies. The entire 4 million-gallons-per-day water plant is especially designed to enable the isolation of treatment operations for special study without undue interference with the production and supply of treated water to the University. The Iowa River, which flows through the University Campus, and the Coralville Reservoir, located approximately 5 miles upstream, serve as "natural laboratories" for water quality and limnological research.

Facilities for research in thermal sciences consist of a solar-energy collector test stand with provision for simultaneous evaluation of several collectors, solar energy thermal storage facility, electric and acoustic aerocolloidal agglomeration apparatus, an RF plasma facility with spectroscopic diagnostic equipment, a spectral bidirectional reflectometer for radiant property measurements of rough surfaces, an interferometric holography laboratory and a pulsatile flow loop under development. The laboratories are served by a minicomputer-

based data acquisition system with direct communication links to the University Computer Center.

Financial Aid

Since the Division's faculty is engaged in a wide variety of sponsored research projects, a majority of the 75 graduate students working with the professors in the Division receive research assistantships. Of these, the Institute of Hydraulic Research employs some 30 to 35 graduate students half-time to work on projects in fluid mechanics, hydraulic engineering, water quality and water resources. The Division of Energy Engineering offers similar assistantships for student participation in research projects in the thermal and environmental sciences. A limited number of fellowships and teaching assistantships are also available from the Division. Graduate students receiving financial support from the Division are required to register for at least nine semester hours of course and/or research work.

The Division of Energy Engineering also encourages undergraduate involvement in its research through the University Work Study Program and the Undergraduate Research Participation Program.

Courses

Core Engineering Program Courses

520:16 Thermodynamics I 4 s.h.
Basic elements of classical thermodynamics, including first and second laws, reversibility, irreversibility, Carnot Cycle, properties of pure substances; closed simple systems and one-dimensional steady-flow open systems; engineering applications. Prerequisite: 4:13. Corequisite: 22M:36.

520:20 Mechanics of Fluids and Transfer Processes 4 s.h.
Laws governing fluid flow and associated transport processes; ideal fluid flow; laminar and turbulent flow phenomena; heat and mass transfer in fluids; measurement of flow properties. This course includes scheduled laboratory experiments. Prerequisite: 22M:37, 520:16, or 560:10.

Special Program Courses

528:80 Experimental Engineering 4 s.h.
Principles of physical measurements; standards calibration, estimation of error; static and dynamic performance of measuring systems; laboratory experience; planning experiments. Prerequisite: junior standing in engineering. Same as 568:80.

521:81 Elementary Bio-Engineering 3-4 s.h.
Elements of basic biology; emphasis on application to problems in engineering. Prerequisite: 37:3.

528:82 Mechanical Engineering Design II 3 s.h.
Primary effort devoted to completion of a substantial design project. Continuation of 568:52. Prerequisite: 568:52. Same as 568:82.

General Courses

527:101 Energy in Contemporary Society 3 s.h.
Technical, legal, economic and behavioral issues in energy production, delivery and use; emphasis on cross-disciplinary implications of energy systems. Prerequisite: junior, senior, professional or graduate standing in the University. Same as 44:191, 91:191,12:114.

527:102 Technology of Environmental Pollution Control 3 s.h.
Application of scientific and engineering principles to the control of the release of pollutants to the air, water and land environment; includes water and wastewater treatment, air pollution and its control, and solid wastes management, including resource recovery. Prerequisite: senior standing in the University.

527:104 Environmental Planning and Assessment 3 s.h.
Planning for and the assessment of the environmental impacts of man-made systems, including transportation, water resource, power generation, housing and other facilities. Prerequisite: graduate standing in the University.

520:111 Numerical Calculations 3 s.h.
Development of algorithms for numerical differentiation and integration; solution of algebraic and differential equations with emphasis on digital computations; initial and boundary value problems. Prerequisite: 22M:38 or equivalent. Same as 560:111.

520:112 Engineering Analysis 3 s.h.
Provides access to a variety of mathematical techniques important to science and engineering, e.g., partial differential equations, special functions, operational methods, integral transformations, nonlinear problems, variational techniques, etc.; methods illustrated by practical applications. Prerequisite: senior standing in engineering. Same as 560:112.

520:113 Mathematical Methods in Engineering I 3 s.h.
Vector spaces, matrices, quadratic forms, function spaces, Fourier analyses, multiple integral transformations, linear operators, equations of mathematical physics and second-order partial differential equations. Prerequisite: 22M:38. Same as 560:113.

520:114 Mathematical Methods in Engineering II 3 s.h.
Theory and applications to dynamics of solids and fluids. Eigenfunction expansions, wave propagation in fluids and solids, variational methods, Ritz method, infinite element method. Prerequisite: 520:113. Same as 560:114.

527:115 Analog and Digital Techniques for Data Reduction 3 s.h.
Topics in computer-aided experimentation utilizing analog and digital techniques are presented; including transducers, signal conditioning, analog-to-digital and digital-to-analog conversions, remote sensing and computer architecture. Prerequisite: senior or graduate standing in engineering.

520:211 Advanced Numerical Analysis 3 s.h.
Partial differential and integral equations by finite differences, finite elements and characteristics; truncation errors, numerical stability, convergence, consistency, solution bounds, acceleration techniques; emphasis on nonlinear problems; examples drawn from diffusion, fluid mechanics, wave propagation, solid mechanics. Prerequisite: 520:111 or equivalent. Same as 560:211.

520:212 Advanced Engineering Analysis 3 s.h.
Modeling of engineering problems by mathematical equations; mathematical solution techniques for differential equations; interpretation of mathematical solutions; emphasis on modeling, solution techniques and interpretation may vary with instructor and student interest; applications in kinematics, mechanics, vibrations, fluid mechanics and heat transfer. Prerequisite: 520:112 or equivalent. Same as 560:212.

Thermal Sciences and Transport Phenomena

528:40 Thermodynamics II 3 s.h.
Kinetic theory of gases; mixtures of gases, psychrometric mixtures; thermodynamics of combustion and chemical equilibrium; power and refrigeration cycles; thermodynamics of compressible flow; introduction to statistical thermodynamics. Prerequisites: 520:16, 22M:38.

522:41 Chemical Engineering Thermodynamics 3 s.h.
Applications of thermodynamic principles to chemical and physical processes; prediction of material properties; phase equilibria and chemical equilibria applied to mixtures and reacting systems. Prerequisite: 4:131. Same as 562:41.

522:43 Design for Energy and Momentum Transfer 4 s.h.
Application of fluid mechanics and transport phenomena theory to the design of chemical process equipment for heat transfer, evaporation and drying. Prerequisites: 520:20, 562:42, 22M:37. Same as 562:43.

528:45 Heat Transfer 3 s.h.
Introduction to the principles of heat transfer by conduction, convection and radiation; analytical and numerical methods of solution; applications to engineering problems. Prerequisites: 520:20, 528:40.

528:140 Intermediate Thermodynamics 3 s.h.
Thermodynamics of irreversible processes; kinetic theory; statistical thermodynamics; applications to thermodynamic properties and selected topics. Prerequisite: 528:40.

522:141 Nonequilibrium Thermodynamics I 3 s.h.
Phenomenological treatment of irreversible processes; foundations of nonequilibrium thermodynamics; conservation laws; entropy balance; Onsage relations; theory of transformations; application to continuous media; coupled phenomena. Prerequisite: 522:144. Same as 562:141.

522:144 Transport Phenomena I 3 s.h.
Unified treatment of momentum, mass, energy transport in chemical engineering problems; use of vector and tensor notations in expressing equations of continuity, motion and energy. Prerequisite: 522:43, 562:44. Same as 562:144.

525:144 Direct Energy Conversion 3 s.h.
Introduction to thermoelectric, photovoltaic, thermionic and MHD generators, fuel cells, controlled fusion, etc. Prerequisite: senior or graduate standing in any branch of engineering.

528:145 Intermediate Heat Transfer 3 s.h.
Steady and unsteady conduction; forced and natural convection; surface and gaseous radiation; condensation and evaporation; analytical and numerical methods and applications. Prerequisite: 528:45.

521:146 Biotransport Processes 3 s.h.
Application of momentum, heat and mass transfer principles to biological systems with particular emphasis on human beings. Such topics as fluid mechanics of time-dependent flows in the circulatory system, heat exchange between a biological system and its environment as well as mass transfer in membranes are examined. Prerequisites: 520:16, 520:20, 521:81.

528:148 Solar Energy Applications 3 s.h.
Solar radiation, extraterrestrial and at the earth's surface; measurements and estimations; radiation characteristics of opaque and partially transmitting materials; flat plate and focusing collectors; energy storage; complete systems for building and water heating and for air-conditioning. Prerequisite: 528:45 or consent of instructor.

528:240 Kinetic Theory of Gases 2-3 s.h.
Fundamental treatment of kinetic theory of gases; topics include: binary collisions; Boltzmann equation, H-theorem; equations of fluid mechanics; special solution techniques; applications. Prerequisites: 528:140 or equivalent.

522:241 Nonequilibrium Thermodynamics II 3 s.h.
Quasimolecular treatment of irreversible phenomena, internal variables, absolute rate theory. Relation to internal variable theory. Thermodynamic derivation of constitutive equations for dissipative solids. Prerequisite: 522:141. Same as 562:241.

522:244 Transport Phenomena II 3 s.h.
Applications of complex variables and conformal mapping to transport phenomena; boundary layer theory; turbulent transport; interface transfer; unsteady state transport. Continuation of 522:144, which is prerequisite. Same as 562:244.

528:245 Conductive Heat Transfer 3 s.h.
Fundamentals of conductive heat transfer; analysis of conduction in media including heat conduction equation, thermal conductivity, steady and transient heat conduction, and heat conduction with moving boundaries; analytical and numerical treatment of practical problems. Prerequisite: 528:145 or equivalent.

528:246 Convective Heat Transfer 3 s.h.
Fundamentals of convective heat transfer; analysis of forced and free convection; differential and integral formulation of boundary layer; heat, mass and momentum transfer in laminar and turbulent flows inside tubes and in external surfaces; combined forced and free convection; convection at high velocities. Prerequisite: 528:145 or equivalent.

528:247 Radiative Heat Transfer 3 s.h.
Fundamentals of radiant energy transport and analysis of radiative interchange among surfaces separated by nonparticipating and participating media; radiation properties of solids and gases; pyrometry; combined radiation-conduction and radiation-convection heat transfer. Prerequisite: 528:145 or equivalent.

Environmental Sciences

523:150 Principles of Environmental Engineering 3 s.h.
Physical, chemical and biological principles of water and wastewater treatment, air pollution control and solid wastes management. Prerequisite: senior or graduate standing in engineering.

523:151 Hydraulic Systems Design in Environmental Engineering 3 s.h.
Application of hydraulic principles to the design of transport systems in environmental engineering with emphasis on water transmission and wastewater and storm water collection and treatment systems. Prerequisite: 523:65.

523:152 Environmental Chemistry 3 s.h.
Principles of general, qualitative, organic and physical chemistry applied in water and air systems. Prerequisite: 4:13 or equivalent.

523:153 Environmental Chemistry Laboratory 2 s.h.
Laboratory procedures in the routine physical, chemical and biological analysis of water, wastewater and solid wastes. Pre- or corequisite: 523:152.

523:154 Environmental Microbiology 3 s.h.
Fundamentals of microbiology with applications in water quality and wastewater treatment systems. Corequisite: 523:152.

523:155 Limnology 2-3 s.h.
Physical, chemical and biological characteristics of natural waters with emphasis on the relationships between the biota and the physiochemical aspects of the aquatic environment. Prerequisites: 523:152, 523:154.

523:156 Environmental Operations and Processes 4 s.h.
Theory of physical, chemical and biological unit operations and processes in water and wastewater treatment. Prerequisites: 523:150, 523:152, 523:154.

523:157 Environmental Engineering Design 3 s.h.
Practical aspects of the design of water and wastewater treatment systems. Corequisite: 523:156.

523:158 Air Pollution and Solid Wastes 3 s.h.
Sources, characteristics and effects on environmental quality of air pollutants and solid wastes. Analysis and design of control systems, including the recovery of resources from solid wastes. Prerequisite: senior or graduate standing in engineering.

528:160 Air Pollution and Control Technology 3 s.h.
Air pollution causes and effects; diffusion through the atmosphere with meteorological, climatological and topographical effects; chemical reactions and natural cleansing mechanisms; concepts in control technology. Prerequisite: Senior or graduate standing in engineering or science.

523:250 Advanced Environmental Systems Design 2 s.h.
Physical, chemical and biological aspects of natural ground and surface waters and the effects of pollutant discharges on water quality. Prerequisites: 523:152, 523:154.

523:251 Environmental Systems Modeling 3 s.h.
The mathematical modeling of environmental processes, including aquatic, atmospheric, terrestrial and treatment systems. Study, analysis and application of existing models. Prerequisite: 523:156. Corequisite: 523:250.

523:252 Advanced Environmental Chemistry 3 s.h.
Lectures and laboratory dealing with advanced concepts and instrumental methods in the analysis of water, wastewater, air and solid wastes. Prerequisites: 523:152, 523:153.

523:254 Environmental Toxicology 2 s.h.
The nature and sources of toxic substances in the environment and their metabolic and ecological effects on humans and other living forms. Prerequisites: 523:152, 523:154.

523:256 Environmental Systems Laboratory 2 s.h.
Laboratory evaluation and discussion of the unit operations and processes in water and wastewater treatment with emphasis on the interpretation of theoretical concepts in full-scale systems. Prerequisite: 523:156.

523:257 Industrial Water Quality Control 3 s.h.
Quantity, quality and treatment of various industrial process waters. Sources, characteristics and treatment of industrial wastewaters to meet effluent standards and requirements for multiple use and reuse. Prerequisite: 523:156.

Fluid Mechanics

523:65 Flow Systems in Environmental Engineering 3 s.h.
Application of the principles of hydrology and hydraulics to the analysis and design of water and wastewater transfer systems. Prerequisite: 520:20.

528:165 Intermediate Mechanics of Fluids I 3 s.h.
Kinematics of fluid flow; rigorous derivation of the equations of fluid flows; conservation of mass, momentum and energy; stress-rate of strain relations; Navier-Stokes equations, applications to simple flow systems; introduction to the effects of viscosity, gravity, compressibility and surface tension; elements of potential flow theory. Prerequisite: 520:20.

528:166 Intermediate Mechanics of Fluids II 3 s.h.
Real and ideal flows; boundary layer concepts; laminar boundary layers, wakes and jets; introduction to turbulent flows; in conduits, boundary layers, wakes and jets; compressible laminar and turbulent flows. Continuation of 528:165, which is prerequisite.

528:167 Experimental Methods in Fluid Mechanics 3 s.h.
Design and execution of several experiments; each student required to plan and execute a special experiment and interpret the results. Supplemental lectures on similitude, analogies and experimental methods. Prerequisite: 520:20.

528:170 Elements of Gas Flows 3 s.h.
Thermodynamics of compressible fluid flow with applications of continuity, momentum and energy equations; flow with variable and constant area, with and without friction, with and without heat transfer. Prerequisites: 520:20, 528:40.

528:171 Compressible Fluid Flow 3 s.h.
Basic phenomena in compressible fluids; dynamics of a perfect gas; acoustics and shock waves; methods of characteristics and hodograph; subsonic, supersonic and transonic flows; singular perturbation techniques; slender and blunt body flows; blast waves; similarity concepts. Prerequisite: 528:170.

528:172 Aerodynamics 3 s.h.
Review of thermodynamics and fluid mechanics; potential flow; complex variables and conformal transformation; two-dimensional airfoil theory; lift and moments; influence of viscosity; aerodynamic characteristics of wings in subsonic, transonic and supersonic flow; simple wing forms. Prerequisites: 22M:38, 520:20.

528:265 Viscous Flow 3 s.h.
Navier-Stokes equations; Stokes and Oseen approximations; laminar boundary-layer calculation procedures; integral and differential methods, heat and mass transfer; wakes and jets; transition; turbulent flows: phenomenological theories, calculation of boundary layers, wakes and jets. Prerequisite: 528:166.

528:266 Boundary Layer Theory 3 s.h.
In-depth study of boundary layers including influence of compressibility, heat and mass transfer, unsteadiness, rotation and three-dimensionality; review of recent advances in treatment of complex laminar and turbulent flows. Prerequisite: 528:265.

528:267 Hydrodynamics I 3 s.h.
Flow of an inviscid, incompressible fluid; theory for steady and unsteady, two- or three-dimensional, irrotational flows; basic regular and singular solutions in various coordinate systems; method of images; Greens functions, integral equations; conformal mapping. Prerequisite: 528:166, 22M:118 or equivalent.

528:268 Hydrodynamics II 3 s.h.
Forces and moments acting on bodies and boundaries in an inviscid, incompressible fluid, flows with vorticity; some relevant integral-equation theory. Continuation of 528:267, which is prerequisite.

528:269 Stability Theory in Fluid Mechanics 3 s.h.
Basic and disturbance equations; linear stability theory for parallel flow, boundary-layer flow; influence of rotation, heat transfer, Mach number and two-phase flow; higher-order theories of instability; practical applications. Prerequisite: 528:165.

528:270 Surface Waves in Fluids 3 s.h.
Infinitesimal and shallow-water waves; higher-order theories; Stokian, solitary and coastal waves; exact solutions and approximations; special boundary problems; diffraction of waves; flow about submerged obstacles; waves in bounded basins; initial value problems. Prerequisite: 528:166.

528:271 Geophysical and Ecological Fluid Dynamics 3 s.h.
Dynamics of rotating fluids; effects due to earth rotation and gravitation; circulations, seiches and tides; atmospheric boundary layer; flows with density stratification; transport phenomena and their interactions with life processes; applications to lakes, oceans and atmosphere, and ecological implications. Prerequisite: 528:166.

528:272 Environmental Dispersion Processes 3 s.h.
Review of classical diffusion theories; longitudinal dispersion, and transverse and vertical mixing in free-surface turbulent shear flow; application to natural channels; selected topics including dispersion of suspended sediment and bed load, mixing and dispersion of heated effluents. Prerequisite: 528:165. Corequisite: 528:166.

528:273 Theory of Turbulence 3 s.h.
Basic concepts in turbulent flow; phenomenological and statistical descriptions of turbulence; turbulent wakes, jets, mixing layers; pipes and channels; transport of heat and other contaminants; thermal plumes; atmospheric turbulence; mathematical modeling; experimental measurement. Prerequisite: 528:165.

522:274 Molecular Flow 3 s.h.
Applications of statistical mechanics to molecular flow; prediction of transport properties of gases; absolute rate theory applied to surface phenomena; Knudsen flow; gas separation processes. Prerequisite: 522:144. Same as 562:246.

522:275 Rheological Fluid Flow 3 s.h.
Rheological properties of fluids; laminar and turbulent flow of non-Newtonian fluids; engineering applications of rheological fluid flow. Prerequisite: 522:144. Same as 562:248.

Hydraulic Engineering and Water Resources

523:180 Flow in Open Channels 3 s.h.
Energy and momentum principles in open channel flow; uniform flow; gradually varied flow; rapidly varied flow; unsteady flow; flood routing. Prerequisite: 520:20.

523:181 Irrigation and Drainage 2 s.h.
Fundamental principles of irrigation engineering including sources and supply of irrigation water; soil-water, plant-climate relationships; irrigation methods, networks and structures; agricultural drainage; planning of irrigation and drainage systems. Prerequisite: 520:20.

523:182 River Control and Water Power Engineering 3 s.h.
Survey of selected topics including planning and economics of water resources projects; river morphology; reservoirs; flood control works; river navigation works; hydraulic machinery; hydroelectric power installations. Prerequisite: 520:20.

523:183 Mechanics of Sediment Transportation 2 s.h.
Laws governing fall velocity, applications to particle-size analysis; incipient motion, bed forms, bed load, suspended load; natural river processes; theory and practice of movable-bed model experiments. Prerequisite: 523:180.

523:184 Hydraulic Design 3 s.h.
Classification and functions of hydraulic structures; selection of type of dam; hydraulic design of spillways, energy dissipators, gates, outlet works, canals and other water conveyance structures; municipal and industrial outfall structures. Prerequisites: 523:180, 523:188.

523:185 Porous Media Hydrodynamics 2 s.h.
Governing equations of porous media flow and prediction of transport properties; analysis of wells, seepage, drainage, recharge, multiple-phase flow. Prerequisite: 528:165.

523:188 Hydrology 3-5 s.h.
Occurrence and distribution of water by natural processes; climatological and stream-flow data; frequency and intensity of storms and floods; infiltration and runoff estimates; storage problems. Prerequisite: 520:20.

523:189 Water Resources Systems 3 s.h.
Application of probability and statistical theory, operations research, and economics to the planning, design and operation of water projects: multi-objective analysis, sequential optimization, human factors and environmental objectives, trade-off analysis, and modeling techniques as applied to water resources. Prerequisite: 523:188.

523:280 Coastal Hydrodynamics 3 s.h.
Waves, tides, harbor oscillations; coastal structures, salinity intrusion and sediment transportation in estuaries; beach processes and evolution. Prerequisite: 528:166.

523:281 Hydraulic Analysis of Unsteady Flow 2-4 s.h.
Unsteady motion of fluid confined by solid boundaries; resistance effects; compressibility effects; stability of oscillations in complex systems; unsteady motion with free surface. Prerequisite: 528:166.

523:288 Stochastic Hydrology 2 s.h.
Flood analysis; risk; precipitation, stream flow extreme theory; hydrologic Markov processes; autocovariance; spectral, reservoir range, and drought and flood length analysis; hydrologic series decomposition; operations hydrology (data generation); properties transferrance. Pre- or corequisites: 22S:120, or 22S:153 and 22S:154, or equivalent.

523:289 Advanced Water Resources Development 2-3 s.h.
Interdepartmental seminar on sociological, economic, legal, engineering, environmental, human factor, and other aspects of water resources development and water resources research. Prerequisite: consent of instructor.

Seminars, Advanced Topics and Research

528:91 Professional Seminar 0 s.h.
Introduction to the professional aspects of mechanical engineering. Speakers, field trips, films and panel discussions used to present selected topics. Each mechanical engineering undergraduate is required to complete four semesters of 528:91.

527:98 Individual Investigations arr.
Laboratory investigations, computer studies, literature surveys, design studies are suitable independent projects for undergraduates. Arranged between student and faculty adviser. No more than 5 s.h. may be taken for degree program. Prerequisite: consent of faculty adviser.

527:190 Readings in Energy Engineering arr.
For graduate students with nonengineering majors who desire credit in undergraduate engineering courses. May be repeated. Prerequisite: consent of instructor.

527:191 Fluid Mechanics and Hydraulics Seminar arr.
Recent topics in fluid mechanics and hydraulics are presented and discussed by students, faculty and guest lecturers. Prerequisite: graduate standing.

523:191 Environmental Engineering Seminar 0 s.h.
Discussions of research and recent advances in environmental science and engineering by students, faculty and guest lecturers. Prerequisite: senior or graduate standing.

528:191 Mechanical Engineering Seminar 1-2 s.h.
Recent topics in mechanical engineering are presented and discussed by students, faculty and guest lecturers. Prerequisite: senior or graduate standing.

527:195 Contemporary Topics in Energy Engineering arr.
New topics in fluid, thermal and environmental sciences not covered elsewhere are presented from time to time. Topic and coverage in the course determined by student and faculty interest. Prerequisite: consent of instructor.

527:198 Individual Investigations arr.
Laboratory investigations, computer studies, literature surveys and design studies are suitable projects for independent study. Project arranged between student and faculty adviser. Prerequisites: graduate standing and consent of faculty adviser.

527:199 Research: Energy Engineering, M.S. Thesis arr.
For fulfillment of M.S. degree requirements. Prerequisite: consent of faculty adviser.

527:295 Advanced Topics in Environmental Sciences arr.
Special studies and projects on advanced environmental topics of theoretical and practical significance in environmental science and engineering. May be repeated for credit. Prerequisite: consent of instructor.

527:296 Advanced Topics in Thermal Sciences arr.
Advanced treatment of topics in thermodynamics, energy processes, combustion, heat and mass transfer, and related experimental and analytical techniques. Selection of subject and content will be determined by instructor and student interest. Prerequisite: consent of instructor.

527:297 Advanced Topics in Fluid and Hydraulic Engineering arr.
An in-depth study of topics in fluid mechanics, hydraulics, water resources, data acquisition systems and related mathematical concepts. Topics and coverage may vary with each offering and will be determined by instructor and student interest. Prerequisite: consent of instructor.

527:299 Research: Energy Engineering, Ph.D. Thesis arr.
For fulfillment of Ph.D. degree requirements. Prerequisite: consent of faculty adviser.

Division of Information Engineering

Chair: Robert C. Arzbaecher
Faculty: *professors* Robert C. Arzbaecher, Dong H. Chyung, Earl D. Eyman, Adrianus Korpel, George M. Lance, Karl E. Lonngren, Sudhakar M. Reddy, John P. Robinson
professor emeritus Lawrence A. Ware
associate professors Everett D. Alton, Donald M. Levy, Nan K. Loh, Norbert R. Malik
assistant professor Steve M. Collins

The Division of Information Engineering coordinates laboratories in the Electrical Engineering Program with the Core Engineering Dynamic Systems Analysis courses and the Electromagnetic Theory

course. The Division assumes responsibility for the teaching of the core courses, as well as all the courses in the Electrical Engineering Program.

Research is encouraged in the appropriate programs as well as interdisciplinary areas of current interest. Well established and funded research laboratories exist in the following special areas:

Applied Physics

Plasma physics and electro-optics investigations utilize specialized laboratories in both the engineering building and physics research building. Typical projects involve nonlinear wave interaction, plasma instabilities, laser optics and acoustic wave behavior.

Applications to Biology and Medicine

Computer-assisted electrophysiology, heart arrhythmia analysis, drug infusion, and other medically-related computer investigations utilize another laboratory with its own real-time computer system. These projects involve close collaboration with colleagues in the College of Medicine.

Control Systems

In cooperation with outside agencies, several projects applying modern control theory are in progress. These include stability considerations, time delay, and digital implementation. In the controls laboratory, investigation of real-time digital control, nonlinear system theory, and digital estimation utilizes mini and micro computers.

Computer Systems

Fault-tolerant subsystem design and reliable system configurations are typical project areas. Other topics include data security, data communications, networks, and self-checking systems.

Close cooperation with colleagues in statistics, computer science, mathematics, medicine, physics, and zoology permit the faculty and graduate students to expand the tools of engineering to other areas of knowledge.

Computer laboratories are provided for undergraduate and graduate student use for study and research in analog, digital, and hybrid computation and simulation. These include individual microprocessors as well as a multi-minicomputer time sharing system for teaching and research.

Financial Aids

A number of fellowships, traineeships, assistantships, scholarships and industrial grants are available to graduate students who qualify. These are awarded on a competitive basis.

Courses

Core Engineering Program Courses

540:11 Dynamic Systems Analysis I **3 s.h.**
Analysis of dynamic behavior of physical systems; use of mathematical models to aid in understanding system response; unified treatment of electrical, mechanical, fluid and thermal systems. Laboratory included. Corequisite: 22M:36.

540:12 Dynamic Systems Analysis II **3 s.h.**
Treatment of more complex systems in systematic manner; development of general techniques applicable to all types of physical systems; laboratory included; continuation of 540:11. Prerequisites: 540:11, 22M:36.

540:14 Dynamic Systems Analysis for Transfer Students **3 s.h.**
One-semester treatment of material covered in 540:11 and 540:12; for transfer students having one year of credit in college physics; laboratory included. Prerequisite: 22M:36.

540:25 Electromagnetic Theory **4 s.h.**
Electric and magnetic forces, Maxwell's equations wave propagation; applications including radiation, guided waves, circuit theory and electromechanical energy conversion. Prerequisites: 22M:37, 540:11.

Special Program Courses

545:80 Principles of Electrical Engineering Design I **3 s.h.**
Design problems using basic electrical devices and equipment; emphasis on the application of discrete devices, e.g. diodes, transistors, FETs, etc. Prerequisite: 540:12 or 540:14.

545:81 Principles of Electrical Engineering Design II **3 s.h.**
Design problems in electrical engineering, with emphasis on small-scale and medium-scale integrated circuits and advanced amplifiers. Prerequisites: 545:40, 545:80.

545:82 Principles of Electrical Engineering Design III **3 s.h.**
Design problems in various electrical engineering areas; areas currently chosen are linear integrated circuits, digital integrated circuits, control systems, microwaves, plasma physics, solid-state physics, and electromagnetic theory. Prerequisites: 545:81, 540:25.

545:83 Principles of Electrical Engineering Design IV **3 s.h.**
This final design course is an individual project of the student's own choice. Demonstration of the completed project and a formal engineering report are required. Prerequisite: 545:81.

541:185 Biological Systems Analysis **3 s.h.**
Application of principles of control theory to analysis of biological systems; development of computer simulation techniques to study dynamic response of physiological systems. Prerequisites: 22M:28 or 22M:38, 29:12 or 29:18 or 540:12.

541:186 Biomedical Measurements **3-4 s.h.**
Design, development, and utilization of contemporary electronic instrumentation for measuring biomedical variables of clinical and research interest. For 4 s.h. option, student chooses a special project. Consult the course instructor for specific projects available. Prerequisite: 540:12 or 29:12 or 29:18.

Digital Systems

545:30 Digital and Computer Systems **3 s.h.**
Logic of switching circuits; analysis and synthesis of combination and sequential circuits; introduction to digital computer, organization and operation, subsystems and devices; lab arranged. Prerequisite: 580:4.

545:130 Switching Theory **3 s.h.**
Combination and sequential logic networks; cellular logic arrays; hazards and faults; fault testing and diagnosis, design techniques to facilitate testing; reliable logic networks; automated design. Prerequisite: 545:30.

545:132 Computer Organization **3 s.h.**
Microprocessors; mini-computers, macromodules including memories, arrays, control modules, input-output organization; input-output modules; arithmetic algorithms; microprogramming with applications; interrupts and input-output organization; hardware features for real-time applications. Prerequisite: 545:30.

545:134 Computer Communications **3 s.h.**
Communication systems components; digital communication systems; channel errors, codes for error control; waveform distortion, equalization, modems; multiplexing; computer communications; data structures, terminals; protocol, routing, security, computer networks. Prerequisite: senior standing in electrical engineering or computer science. Same as 22C:178.

545:136 Minicomputers **3 s.h.**
Introduction to minicomputers; machine and assembler language programming; on-line and real-time applications; projects using PDP-11/34 computers. Prerequisite: 545:30.

545:137 Microcomputer-based Systems **3 s.h.**
Design of microcomputer-based systems; microprocessors and support chips, interfacing, machine and assembly language programming, real-time system design; laboratory projects. Prerequisite: 545:30 or consent of instructor.

545:230 Advanced Switching Theory **3 s.h.**
Logical completeness, modular logic design, array logic, fault diagnosis, logic design to facilitate testing, fault-tolerant circuits, topics from current literature. Prerequisite: 545:130. Same as 22C:222.

545:236 Minicomputer Systems **3 s.h.**
Advanced topics in minicomputer systems; real-time operating systems, advanced programming techniques for on-line and real-time applications, interfacing; individual projects. Prerequisite: 545:136.

Electronics

545:40 Electronic Circuits I 3 s.h.
Physics of solid state electronic devices; pn junction diodes, field effect transistors, bipolar transistors, vacuum tubes, and piecewise linear circuit models; basic amplifiers and biasing networks. Prerequisite: 540:12.

545:41 Electronic Circuits II 3 s.h.
Active circuit design based on device theory from 545:40; amplifier design, basic feedback and oscillator theory, high-frequency applications of solid state devices; electronic communication system design theory. Prerequisite: 545:40.

545:142 Electronics for Applications 3 s.h.
A laboratory-centered course emphasizing functional operation of linear and digital integrated circuits, and practical techniques for using I.C.s in instrumentation and signal processing applications. Prerequisite: 540:12.

545:144 Digital and Linear Integrated Electronics 3 s.h.
Analysis and comparison of logic families, applications, interfacing logic families, MSI, LSI, optoelectronics, op amps, comparators, schmitt triggers, timers, voltage regulators. Prerequisite: 545:41.

545:146 Digital Signal Processing 3 s.h.
Introduction to computer-implemented signal processing systems; digital impulse response and transfer functions; sampling theory, Z-transforms; finite and infinite impulse response digital filters; digital fourier transforms, FFT algorithms and applications to signal processing. Corequisite: 545:50.

Communications

545:50 Communication Systems 3 s.h.
Introduction to signal representation; processing with linear systems and filters; amplitude, frequency, and pulse modulation; performance in the presence of noise; digital communication. Prerequisites: 22M:38, 540:12.

545:150 Statistical Communication Theory 3 s.h.
Deterministic and random signals; correlation functions and power spectral densities; modulation theory, sampling and quantization; multiplexing; signal-to-noise ratio enhancement; information theory and coding. Prerequisite: 545:50.

545:151 Advanced Communication Theory 3 s.h.
Unified approach to principles underlying analog and digital communication systems, random waveforms, optimum receiver principles, efficient signaling for message sequences. Prerequisite: 545:150.

545:252 Information Theory 3 s.h.
Quantitative measure of information; discrete and continuous sources; source encoding and decoding; rate distortion; discrete and continuous channels; channel encoding and decoding. Prerequisite: 545:150.

545:254 Coding Theory 3 s.h.
Use of coding techniques to improve reliability and security of communication and computation systems, error correcting codes, threshold and sequential decoding, encryption, arithmetic codes. Prerequisite: 545:134 or 545:150.

Controls

545:60 Control Systems 3 s.h.
Introduction to linear feedback control systems; transfer functions; time and frequency domain analysis of system characteristics and stability; laboratory experiments. Prerequisites: 22M:38, 540:12.

545:160 Control Theory 3 s.h.
State variable formulations; multiple-input, multiple-output systems; controllability and observability; synthesis and compensation of linear feedback systems; control components; laboratory experiments. Prerequisite: 545:60.

545:162 Advanced Control Theory 3 s.h.
Non-linear control; phase-plane methods; stability; linearization techniques; describing functions; time varying systems; numerical methods; optimal control; adaptive control; stochastic systems and filtering. Prerequisite: 545:160.

545:164 Computer-Based Control Systems 3 s.h.
Application of micro- and mini-computers in control systems; programming for real-time digital control systems; discrete systems, Z-transforms, analog-to-digital and digital-to-analog conversions, sampling, quantization, data communications, priority interrupts, examples of micro- and mini-computer implementations for optimal and adaptive control, filtering, and reconstruction of inaccessible variables; laboratory projects using micro- and mini-computers. Prerequisites: 545:30 and 545:60 or consent of instructor.

545:166 Electromechanical Systems 3 s.h.
Electromechanical energy conversion principles: basic rotating machines; direct-current machines: theory and applications; alternating-current machines: theory and applications. Prerequisites: 540:12, 540:25.

545:168 Power Systems Analysis 3 s.h.
A.C. fundamentals; transmission lines; power system representation, load-flow and stability studies; economic operation; faults; symmetrical components; theory complemented by field study with local power utilities. Prerequisite: 540:12.

545:260 Optimal Control 3 s.h.
The theory of optimal control; existence of optimal solutions, necessary conditions and sufficient conditions for an optimal control, side constraints, computational methods. Prerequisites: 545:160, 22M:116.

545:262 Stochastic Control Systems 3 s.h.
Stochastic processes; random differential equations; decision theory; optimal estimation theory including smoothing, filtering and predicting; stochastic optimal control theory; system identification; pattern recognition. Prerequisite: 545:162 or consent of instructor.

Applied Physics

545:70 Electrical Engineering Materials and Devices 3 s.h.
Introduction to fundamentals of electrical properties of materials, semiconductor electronics, plasma physics, lasers, superconductivity. Prerequisite: 540:25.

545:170 Solid State Physical Electronics 3 s.h.
Physics of solid state electronic devices, band theory of solids, and semiconductor electronics; pn junction, Schottky barrier, tunnel, light emitting, and photo diodes; bipolar junction and field effect transistors; new devices of current interest. Prerequisite: 545:70, 29:83, or 29:193.

545:172 Electromagnetic Theory 3 s.h.
Static and time-varying fields, Maxwell's equations, theory and applications. Prerequisite: 540:25.

545:174 Microwave Theory and Techniques 3 s.h.
Theoretical and experimental studies of guided waves, microwave sources and devices, and applications of high frequency techniques. Prerequisite: 540:25.

545:176 Direct Energy Conversion 3 s.h.
Introduction to thermoelectric, photovoltaic, thermionic and MHD generators, fuel cells, controlled fusion, etc. Prerequisite: senior or graduate standing in any branch of engineering.

545:178 Modern Wave Optics 3 s.h.
Lasers, coherence, planewaves, angular spectrum, fourier transforms, diffraction, holography. Prerequisite: 540:25 or 29:130 or consent of instructor.

Seminars, Advanced Topics, Research

545:91 Professional Seminar 0 s.h.
Lecture and discussions by guest lecturers on topics of current interest in electrical engineering. Prerequisite: junior standing.

547:98 Individual Investigations arr.
Special individual-study topics in engineering for undergraduates as mutually arranged between student and instructor. Prerequisite: consent of instructor.

547:190 Readings in Information Engineering arr.
Permits nonengineering students to receive graduate credit for various subjects in information engineering. Prerequisite: consent of instructor.

547:195 Contemporary Topics in Information Engineering arr.
Special topics in information engineering offered by arrangement with individual faculty members. This course can be on contemporary topics, or a new course without a number, or an experimental course. Prerequisite: consent of instructor.

547:198 Individual Investigations arr.
Special individual-study topics in information engineering as mutually arranged between student and instructor. Prerequisite: graduate standing and consent of instructor.

547:199 Research: Information Engineering, M.S. Thesis arr.
For partial fulfillment of the requirements for the Master of Science degree in information engineering. Prerequisite: consent of adviser.

547:291 Seminar: Plasma Physics arr.
Discussion of current research. Prerequisite: consent of instructor. Same as 29:261.

547:295 Advanced Topics in Information Engineering arr.
Study of recent developments in special areas, primarily by groups, through special arrangements with individual faculty members. Prerequisite: consent of instructor.

547:299 Research: Information Engineering, Ph.D. Thesis arr.
For partial fulfillment of the requirements for the Doctor of Philosophy degree in information engineering. Prerequisite: consent of adviser.

Division of Materials Engineering

Chair: Kwan Rim
Faculty: *professors* Dan E. Branson, Edward J. Haug, Sun-Tak Hwang, Harrison Kane, Howard McCauley, James O. Osburn, Kwan Rim, Ralph I. Stephens, John Merle Trummel
professor emeritus Karl Kammermeyer
associate professors James G. Andrews, Jasbir S. Arora, John K. Beddow, Edward M. Mielnik, Nicolae Orlandea, Arthur F. Vetter, Han-Chin Wu
adjunct associate professors Richard A. Brand, John Wiley, Tai-June Yoo
assistant professors Roy D. Crowninshield, Ray Chong Huang, Youngil Youm

The primary mission of the Division is the analytical and experimental study of material behavior, the establishment of pertinent physical laws and the application of such laws to situations of engineering interest.

The Division is responsible for developing and operating courses of instruction, associated laboratories and graduate study in materials engineering within the Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, and Mechanical Engineering programs. The disciplinary areas associated with the programs are materials science and constitutive theory, structural analysis and design, foundations of chemical and transport processes, and mechanics and mechanical design.

The Division supports research activity by the faculty and students in the Division and assists in the recruitment of qualified graduate students. Research in the Division is of a diverse nature and encompasses the fields of experimentation in and mathematical representation of thermomechanical behavior of materials at the phenomenological as well as molecular level, basic study of transport processes with particular emphasis on mechanisms of diffusion and surface phenomena, modern optimization theories as they relate to the analysis and design of complex structural and mechanical systems, failure of materials through experimentation and basic understanding of failure mechanisms, application of the principles of continuum and theoretical mechanics to the analysis of biomedical systems and the design of prosthetic devices, study of the properties of granular media including powders, soils and the effect of particle shape on physical properties, and the implementation of laws of behavior of concrete and composite building materials in the design of large structures.

Special Facilities

Biomechanics Laboratory

The laboratory is equipped for research in stress analysis and modeling associated with biomechanical systems. Included are a photo-elastic bench with 12-inch transmission polariscope, photo-elastic oven, fringe multiplier, contour projector, photo-stress meter and recording equipment.

Chemical Engineering Laboratory

Located in the Chemistry-Botany Building, this laboratory includes pilot plant equipment for the study of industrial evaporation, distillation, drying, fluid flow and heat transfer. In addition there are a subcritical nuclear reactor and facilities for biomaterials research and investigation of plastics and other materials. Laboratories for individual research by graduate students are equipped with chromatographs, analog computers and other instrumentation. A small shop is available for students to use under the supervision of a technician.

Electron Microscope Laboratory

This instructional and research facility is equipped with an RAC EMU-3F electron transmission microscope and the necessary specimen preparation equipment to permit examination of specimens by the use of thin foil and replica microscopy and selected area diffraction. This facility complements the adjacent facility involving the mechanical behavior of materials. Such phenomena as the following may be studied by use of thin foil technique: the behavior and distribution of dislocations as a result of plastic deformation, stacking fault energy, subgrain boundary formation, radiation damage. Electron fractography and the study of surfaces may be done by use of the replica technique, and phase transformation may be studied by use of selected area diffraction.

Materials Processing Laboratories

This facility consists of the Metal Casting and Welding Laboratory, Metal Cutting Laboratory, and the Heat Treatment and Metallographic Laboratory, all equipped for laboratory instruction and research involving primarily the liquid and solid state of metallic materials. They are equipped with such items as melting and heat-treating furnaces, a variety of welding equipment, foundry sand testing and molding equipment, pyrometers, nondestructive testers, machine tools and tool force dynamometers, metal-forming equipment, metallographic specimen-mounting presses and polishers, a variety of metallurgical microscopes and a darkroom.

Materials Testing Laboratory

This laboratory is equipped for the determination of physical and mechanical properties of materials of engineering interest such as metals, polymers and biomaterials. It includes a compression testing machine, an axial testing machine and a universal testing machine with mechanical and sophisticated multichannel electronic instrumentation for measuring deformation and stress. It also includes an MTS machine suitable for the investigation of fatigue properties of metals. An additional facility in the form of a random function generator for the study of fracture is being added. In addition the laboratory contains a modern creep testing capability with a thermally controlled chamber for conduction of experiments at high temperature. Pulse generator equipment has been acquired more recently for the dynamic response of metals in the high frequency range.

Mechanical Engineering Laboratories

The Mechanical Engineering Laboratories are equipped and instrumented to provide students with educational experience in a wide variety of fields using modern methods of measurement and analysis including computers, a variety of strain gauges, a photo-elastic laboratory and other conventional instrumentation. Particular areas include study of material behavior with emphasis on the mechanics of dynamic systems and mechanisms of failure under both static and cyclic loading.

Powders and Particulates Laboratory

This laboratory is modestly equipped with sampling devices; devices for characterizing bulk properties of powders; various mixers, grinders, sizing equipment; optical microscopes; sintering furnaces; mounting and polishing equipment. In addition there is access to a scanning electron microscope Quantiment 720 system, computer center and specialized engineering and chemistry library facilities and laboratories.

Structural Testing Laboratory

This laboratory is equipped for the determination of physical properties of

materials in engineering construction, such as soils, aggregates, concrete, metals, timber and plastics. Included are a compression testing machine, a universal testing machine and an axial testing machine, along with mechanical and electronic instrumentation for the accurate measurement of deformations under load. The laboratory also contains a prestressing bed and frame which permits construction of prestressed concrete structural members. A soils laboratory contains consolidation and triaxial testing equipment of the latest design.

Divisional Financial Aid

Support is available for graduate students from several sources including assistantships, scholarships and federal grants. Stipends are comparable to those of other departments and academic units of the University and are granted on the basis of academic excellence and research interests of the Division. Graduate enrollment is approximately 60 students. Limited financial aid for undergraduates is available from assistantships and grants. These are in addition to the scholarships awarded by the University and the College of Engineering.

Courses

Core Engineering Program Courses

560:7 Statics 2 s.h.
Vector algebra, forces, couples, equipollent force and couple systems, Newton's laws, friction, equilibrium analysis of particles and finite bodies; applications. Corequisite: 22M:38.

560:10 Dynamics 3 s.h.
Vector calculus, Newton's laws, dynamics of particle motion, multiparticle systems, and rigid bodies in plane motion; applications. Prerequisites: 560:7, 22M:36.

560:15 Materials Science I 3 s.h.
Foundation course of instruction in materials science to show relationship between structures and properties of materials at atomic, micro and macro levels. Prerequisite: 4:13.

560:19 Mechanics of Deformable Bodies 3 s.h.
Elementary theory of deformable bodies, stress, strain; application to beams, columns, shafts and pressure vessels. Axial, transverse, bending, torsion, combined and buckling loads are treated. Prerequisite: 560:7.

Special Program Courses

568:80 Experimental Engineering 4 s.h.
Principles of physical measurements; standards, calibration, estimation of error; static and dynamic performance of measuring systems; laboratory experience; planning experiments. Prerequisite: junior standing. Same as 528:80.

568:82 Mechanical Engineering Design II 3 s.h.
Primary effort devoted to completion of a substantial design project; continuation of 568:52. Prerequisite: 568:52. Same as 528:82.

561:83 Biomedical Engineering Design I 3-4 s.h.
Creative design projects which usually involve actual current problems in biomedical engineering. Projects are interdisciplinary, including both engineering and health science faculty cooperation. Prerequisite: 521:81.

561:84 Biomedical Engineering Design II 3-4 s.h.
Continuation of 561:83. Prerequisites: 561:83 and senior standing.

General Courses

567:101 Surveying 3 s.h.
Theory of measurements, methods and computations, mapping, route surveying, geodetic surveying, photogrammetry and astronomy.

560:111 Numerical Calculations 3 s.h.
Development of algorithms for numerical differentiation and integration; solution of algebraic and differential equations with emphasis on digital computations; initial and boundary value problems. Prerequisite: 22M:38. Same as 520:111.

560:112 Engineering Analysis 3 s.h.
Introduction to mathematical techniques important in engineering modeling; special functions; operational methods, integral transformations, variational techniques, partial differential equations; applications to engineering problems. Prerequisite: senior standing. Same as 520:112.

560:113 Mathematical Methods in Engineering I 3 s.h.
Vector spaces, matrices, quadratic forms, function spaces, Fourier analysis, multiple integral transformations, linear operators, equations of mathematical physics and second-order partial differential equations. Prerequisite: 22M:38. Same as 520:113.

560:114 Mathematical Methods in Engineering II 3 s.h.
Theory and applications to dynamics of solids and fluids. Eigenfunction expansions, wave propagation in fluids and solids, variational methods, Ritz method, finite element method. Prerequisite: 560:113. Same as 520:114.

560:211 Advanced Numerical Analysis 3 s.h.
Partial differential and integral equations by finite differences, finite elements and characteristics; truncation errors, numerical stability, convergence, consistency, solution bounds, acceleration techniques; emphasis on nonlinear problems; examples drawn from diffusion, fluid mechanics, wave propagation, solid mechanics. Prerequisite: 560:111 or equivalent. Same as 520:211.

560:212 Advanced Engineering Analysis 3 s.h.
Modeling of engineering problems with mathematical equations; solution techniques for differential equations; interpretation of mathematical solutions; applications to fluid, mechanical and thermal systems. Prerequisite: 560:112. Same as 520:212.

Structural Analysis and Design Courses

563:31 Structural Analysis I 4 s.h.
Analysis of stresses in beams, trusses and frames; influence lines; deformation by classical methods; indeterminate structural analysis by superposition and by moment distribution. Prerequisite: 560:19.

563:35 Structural Design I 3 s.h.
Concepts and procedures in structural design; physical and legal constraints; design of steel and reinforced concrete beams, columns and connections. Prerequisite: 560:19.

563:131 Structural Analysis II 3 s.h.
Classical and matrix formulation, force and displacement methods, energy methods, column analogy method, slope deflection method, moment distribution method, influence lines. Prerequisite: 563:31.

563:132 Matrix Methods in Structural Analysis 3 s.h.
Analysis of structures by use of digital computer; slope deflection, moment distribution, elementary matrix manipulations in structural analysis. Prerequisite: 563:31.

563:135 Structural Design II 3 s.h.
Design of steel and reinforced concrete buildings and bridges, floor systems, footings, retaining walls, composite designs, plate girders, deflection and torsion, prestressed concrete. Prerequisite: 563:35.

563:136 Structural Design III 3 s.h.
Prestressed concrete building and bridge design, steel and reinforced concrete bridge design, high-rise building design, limit analysis and plastic design, shell roof design. Prerequisite: 563:135.

563:138 Prestressed Concrete 3 s.h.
Analysis and design of statically determinate and indeterminate members and structures; time effects; review of current literature and specifications. Prerequisite: 563:135.

563:139 Foundations of Structures 3 s.h.
Application of soil mechanics to foundations of building; bearing capacity and settlement analyses; stability of earth slopes; earth pressures and retaining walls; braced cuts. Prerequisite: 563:56.

563:234 Advanced Structural Analysis by Numerical Methods 3 s.h.
Finite difference methods, relaxation and iteration techniques applied to beams, plates, skew slabs, elasticity problems; numerical procedures applied to deformations; buckling, beam columns, vibration, influence lines. Prerequisite: 563:131.

563:236 Advanced Structural Design 3 s.h.
Advanced topics in design of steel, aluminum, concrete structures; concrete shell roofs. Prerequisite: 563:136.

563:237 Stability of Structural Systems 3 s.h.
Variational methods, stability criterion, elastic and inelastic buckling, columns, beams, plates, rigid frames; torsional and torsional flexural buckling, lateral buckling, approximate methods, buckling of shells. Prerequisite: 563:254.

563:239 Earth Pressures and Retaining Structures 3 s.h.
Earth pressure and slope stability theories; theoretical and empirical bases for design of retaining walls, braced open cuts, anchored bulkheads, cofferdams, tunnels, culverts. Prerequisite: 563:139.

Chemical and Transport Processes Courses

562:41 Chemical Engineering Thermodynamics 3 s.h.
Applications of thermodynamic principles to chemical and physical processes; prediction of material properties; phase equilibria and chemical equilibrium applied to mixtures and reacting systems. Prerequisite: 4:131. Same as 522:41.

562:42 Process Calculations 3 s.h.
Solutions of industrial problems using material and energy

balances. Stoichiometric and nonstoichiometric chemical reactions, change of state, solutions and mixing problems are included. Prerequisite: 22M:36.

562:43 Design for Energy and Momentum Transfer 4 s.h.
Application of fluid mechanics and transport phenomena theory to the design of chemical process equipment for heat transfer, evaporation and drying. Prerequisites: 562:42, 520:20, 22M:37. Same as 522:43.

562:44 Mass Transfer Operations 3-4 s.h.
Fundamental principles of diffusional processes. Topics covered include diffusion, distillation, extraction, absorption, leaching, humidifaction, adsorption, drying, ion-exchange and less conventional separations. Prerequisite: 4:131.

562:45 Chemical Reaction Kinetics 2-3 s.h.
Application of chemical reaction rates to design of chemical reactors; batch reactors, mixed flow reactors, plug flow reactors; temperature and pressure effects on reactor design. Prerequisite: 4:131.

562:46 Economics in Design 3 s.h.
Economic principles applied to the design and operation of chemical process plants. Prerequisites: 562:43, 562:44.

562:47 Unit Operations Lab I 2 s.h.
Laboratory investigations of transport phenomena and chemical engineering unit operations. Design of experiments, operating procedures, data collection techniques, report writing, computer usage and laboratory safety. Prerequisites: 562:43, 562:44.

562:48 Unit Operations Lab II 2 s.h.
Open-ended laboratory studies of transport phenomena, chemical engineering unit operations, process control and reaction kinetics. Emphasis on project design, construction, development and evaluation. Prerequisite: 562:47 or consent of instructor.

562:49 Chemical Engineering Process Design 3 s.h.
Design of chemical process plants, including application of process calculations, thermodynamics, kinetics, computer-aided design, unit operations theory, instrumentation and economics. Prerequisites: 562:43, 562:44, 562:41. Corequisite: 562:45.

562:141 Nonequilibrium Thermodynamics I 3 s.h.
Phenomenological treatment of irreversible processes; foundations of nonequilibrium thermodynamics; conservation laws; entropy balance; Onsager relations; theory of transformations; application to continuous media; coupled phenomena. Prerequisites: 22M:38, 562:41 or 528:140. Same as 522:141.

562:142 Process Dynamics 3 s.h.
Modeling of dynamics of chemical engineering processes and equipment; theory and equipment; theory and operation of industrial instruments for process control. Prerequisites: 562:43, 562:44.

562:143 Equilibrium Stage Processes 3 s.h.
Fundamentals of all stagewise operations; unified theories and methodologies of equilibrium processes; applications to distillation, extraction, sorption, leaching, cascading. Prerequisites: 562:43, 562:44.

562:144 Transport Phenomena I 3 s.h.
Unified treatment of momentum, mass, energy transport in chemical engineering problems; use of vector and tensor notations in expressing equations of continuity, motion and energy. Prerequisites: 22M:38, 562:43, 562:44. Same as 522:144.

562:149 Chemical Engineering Design I 3 s.h.
Chemical engineering process design problems involving thermodynamics, unit operations, kinetics, material selection and economics. May be repeated. Prerequisites: 562:49, 562:45.

562:241 Nonequilibrium Thermodynamics II 3 s.h.
Quasimolecular treatment of irreversible phenomena; internal variables, absolute rate theory. Relation to internal variable theory. Thermodynamic derivations of constitutive equations for dissipative solids. Prerequisite: 562:141. Same as 522:241.

562:243 Separation Processes 3 s.h.
Theory and application of multi-stage processes for separation of mixtures of chemicals on an industrial scale. Prerequisite: 562:143.

562:244 Transport Phenomena II 3 s.h.
Applications of complex variables and conformal mapping to transport phenomena; boundary layer theory; turbulent transport; interface transfer; unsteady state transport; continuation of 562:149. Prerequisite: 562:144. Same as 522:244.

562:245 Surface Phenomena 3 s.h.
Thermodynamics of surfaces; theory of surface tension; interaction of gases with surface; dynamics of surface molecules; applications to separation processes. Prerequisites: 4:131, 562:41 or 528:140, 562:144.

562:246 Molecular Flow 3 s.h.
Applications of statistical mechanics to molecular flow; prediction of transport properties of gases; absolute rate theory applied to surface phenomena; Knudsen flow; gas separation processes. Prerequisite: 562:144. Same as 522:274.

562:248 Rheological Fluid Flow 3 s.h.
Rheological properties of fluids; laminar and turbulent flow of non-Newtonian fluids; engineering applications of rheological fluid flow. Same as 522:275. Prerequisite: 562:144.

562:249 Chemical Engineering Design II 3 s.h.
Process design problems of plant layout, preconstruction cost estimation, profitability. Use of special design methods. May be repeated. Prerequisites: 562:45, 562:49, 562:149.

Mechanics and Mechanical Systems Courses

568:52 Mechanical Systems Design I 4 s.h.
Design considerations for mechanical engineering systems; strength and deflection properties of mechanical elements; kinematic characteristics of linkages and gear trains; bearing analysis. Prerequisite: 560:19.

563:56 Soil Mechanics 3 s.h.
Engineering properties of soils, subsurface exploration, natural soil deposits, laboratory testing. Prerequisite: 560:19.

568:150 Intermediate Mechanics of Deformable Bodies 3 s.h.
Application of equilibrium analyses, strain-displacement relations, constitutive relationships to practical structural systems and elementary plane elasticity problems. Prerequisite: 560:19.

568:152 Kinematics of Mechanisms 3 s.h.
Characteristics of constrained mechanical systems; kinematic analysis of linkage systems, including matrix transformation schemes, force and dynamic analysis with emphasis on computerized methods. Prerequisite: 568:52.

568:153 Mechanical Vibrations 3 s.h.
Fundamental aspects of vibrating motion for simple mechanical systems; free and forced vibration with and without damping; single and multiple degree of freedom systems. Prerequisites: 560:10, 540:12 or 540:14, 560:19.

561:154 Biomechanics 3-4 s.h.
Principles of solid mechanics applied to the analytical and experimental investigation of biological systems, with special emphasis on applications in kinesiology of the human musculoskeletal system. Prerequisites: 560:10, 560:19, 521:81.

568:155 Intermediate Dynamics 3 s.h.
Theoretical and applied Newtonian and Lagrangian analysis of mechanical systems composed of particles and/or rigid bodies in equilibrium and in motion. Prerequisite: 560:10.

563:156 Advanced Soil Mechanics 3 s.h.
Steady state and transient flow through soils; stress-strain behavior, strength theory; shear strength of soils. Prerequisite: 563:56.

568:251 Theory of Elasticity 3-4 s.h.
Concept of stress and strain; field equations of elasticity; theorems of uniqueness and reciprocity; minimum principles; stress functions; extension, torsion, flexure of bars, two-dimensional theory. Prerequisite: 562:175 or 568:150.

568:252 Mechanical Systems Design 3 s.h.
Advanced topics in mechanical systems design and analysis; design optimization; reliability. Prerequisite: 568:152.

568:253 Advanced Mechanical Vibrations 2-6 s.h.
Wave form analysis; systems with many degrees of freedom; random vibration. Prerequisite: 568:153.

563:254 Energy Methods 3 s.h.
Principles of virtual work, stationary and minimum potential energy; analysis of finite dimensional systems; calculus of variations; analysis of continuous systems; buckling theory; Hamilton's principle. Prerequisite: 568:150. Same as 568:254.

568:254 Energy Methods 3 s.h.
Same as 563:254.

563:255 Dynamic Analysis of Structures 3 s.h.
Single degree of freedom systems under various dynamic loads; equations of motion of elastic structures, finite element technique; continuous systems; nonlinear dynamic analysis; earthquake loading. Prerequisite: 568:150.

563:256 Applied Optimal Design 3 s.h.
Linear and nonlinear programming, finite dimensions, optimal design, numerical methods, structural optimization, worst case design, contact stress analysis and surface contour optimization, and other examples. Prerequisite: 22M:105 or 560:113. Same as 568:256.

568:256 Applied Optimal Design 3 s.h.
Same as 563:256.

563:257 Optimization of Structural Systems 3 s.h.
Calculus of variations, continuous optimal design, structural element optimization, dynamic mechanism design, thermal system design and other examples. Prerequisite: 563:256.

563:258 Finite Element Techniques in Engineering 3 s.h.
Basic concepts of finite element techniques in engineering science; mathematical foundation of finite element technique, with emphasis on applications; applications to various problems in structural mechanics, heat transfer, and fluid mechanics. Prerequisites: 560:113, 563:254. Same as 568:258.

568:258 Finite Element Techniques in Engineering 3 s.h.
Same as 563:258.

563:259 Theory of Shells 3 s.h.
General theory of thin shells; membrane analysis; general analysis of cylindrical shells and shells of revolution. Prerequisite: 568:150. Same as 568:259.

568:259 Theory of Shells 3 s.h.
Same as 563:259.

Materials Phenomenology and Science Courses

566:70 Materials Science II 3 s.h.
To help the student appreciate that materials can be designed at the atomic, microstructural and macrostructural levels in order economically to fulfill design criteria. Prerequisite: 560:15.

566:71 Materials Processing I 3 s.h.
Processing of industrially important materials by casting, welding, machining, forming; mass production tools and techniques, numerical control, planning of manufacturing operations. Prerequisite: 566:70.

562:170 Materials Science III 3 s.h.
Foundation course for graduate students in the structure and properties of continuous and discrete materials. Topics include: bonding, structural descriptors, atom movements, defects, and deformation of materials. Prerequisite: 566:70.

562:171 Materials Processing II 3 s.h.
Engineering and metallurgical aspects of casting and welding, including solidification, degasification, liquid-metal slag reactions, melting processes, arc physics, casting and welding processes and materials. Prerequisite: 566:71.

568:173 Theories of Failure in Design 3 s.h.
Definition and criteria of failure; yield phenomena, fatigue, linear elastic fracture mechanics, plane stress and plane strain fracture toughness, J integral, crack opening displacement, corrosion and creep. Prerequisite: 560:19.

562:175 Continuum Mechanics I 3 s.h.
Geometrical foundations; concept of stress and strain tensors; analysis of stress and strain; fundamental physical laws; constitutive equations; applications to solid and fluid mechanics. Prerequisite: 22M:38.

561:176 Biomaterials 2-3 s.h.
Properties, compatibility characteristics and performance requirements of materials for implants and facial and dermal prostheses in the human body. Prerequisites: 4:14, 560:15.

562:177 Fine Particle Characterization 3 s.h.
Introduction to the description and classification of fine particles, based on analysis of physical and chemical properties; descriptors include mathematical, verbal, and graphical models; classification methods include deterministic, statistical and fuzzy classifiers; methods of physical analysis include Fourier, Walsh, and Haar functions; methods of chemical analysis include electron probe and activation analysis. Prerequisite: 4:131 or 29:193.

562:270 Materials Science IV 3 s.h.
Continuation of 562:170. Additional topics include nucleation and growth, shear transformations, other topics related to transformations in materials. Prerequisite: 562:170.

562:272 Selected Topics in Materials Engineering 3 s.h.
Advanced topics in materials processing and materials engineering. Prerequisite: 562:171.

568:273 Theories of Fracture 3 s.h.
Mathematical and phenomenological aspects of fracture. Energy and stress intensity concepts related to elastic, plastic and viscoelastic fracture; time and environmental dependent fracture. Prerequisite: 568:251.

562:275 Continuum Mechanics II 3 s.h.
Foundation of general nonlinear theories of continuum mechanics; thermodynamic foundations, Truesdell-Coleman and internal variable formulations; introduction to nonlinear theories of elasticity, viscoelasticity and viscoplasticity. Prerequisite: 562:175.

562:276 Theory of Viscoelasticity 3 s.h.
Linear theory of viscoelasticity; nonaging materials; Boltzmann superposition principles; linear functionals. Thermodynamic foundations, time-temperature superposition principle. Boundary and initial value problems. Prerequisite: 562:175.

562:277 Theory of Plasticity 3 s.h.
Classical theory of plasticity in terms of yield surface; modern plasticity theories based on internal variables and intrinsic time concepts; application to experimentally observed phenomena. Prerequisite: 562:175.

562:278 Electron Optical Methods 3 s.h.
Transmission electron microscopy, electron diffraction, scanning electron microscopy, electron fractography and microprobe analysis. Prerequisite: 4:131 or 29:193.

562:279 Fine Particle Science and Technology 3 s.h.
Macroscopic, microscopic, and atomic-level structures of individual particles and their sets, in terms of fundamentals of physics, chemistry, and mechanics; interrelationship of these three levels of description, together with the behavior of a set and its component particles to explain the development of fine particle technology.

Seminars, Advanced Topics, Research

561:91 Professional Seminar 0 s.h.
Lectures and discussions on topics of current interest in biomedical engineering. Required of juniors and seniors in the biomedical engineering program. Prerequisite: junior standing.

562:91 Professional Seminar 0 s.h.
Guest lectures, discussions of current interest, experience in conducting business meetings and visits to Iowa factories. Required of chemical engineering juniors and seniors.

563:91 Professional Seminar 0 s.h.
Lectures and discussions on topics of current interest in civil engineering. Required of juniors and seniors in the civil engineering program. Prerequisite: junior standing.

563:97 Senior Project 1 s.h.
A project course for the study of current projects or specific problems in civil engineering, oral and written presentation. Prerequisite: senior standing.

567:98 Individual Investigations arr.
Directed independent study in approved topic. Prerequisite: consent of instructor.

567:190 Readings in Materials Engineering arr.
For graduate students with nonengineering majors who desire credit in undergraduate materials engineering courses. May be repeated. Prerequisite: graduate standing.

562:191 Seminar in Chemical Engineering 0-1 s.h.
Discussion of recent developments in chemical engineering, including the research of the students in the program. Prerequisite: graduate standing.

567:191 Materials and Mechanics Seminar arr.
Recent topics in materials and mechanics, presented and discussed by students, faculty, and guest lecturers. Prerequisite: graduate standing.

567:195 Contemporary Topics in Materials Engineering arr.
Topics significantly related to current and foreseeable needs of society; application of engineering design to meeting these needs; typical current topics include safety, reliability and noise. Prerequisite: senior standing.

567:198 Individual Investigations arr.
Independent investigations of an approved topic on a one-semester basis. Prerequisite: consent of instructor.

567:199 Research: Materials Engineering, M.S. Thesis arr.
Experimental and analytical investigation of an approved problem leading to a Master of Science degree. Prerequisite: consent of program chair and major adviser.

567:295 Advanced Topics in Chemical and Materials Engineering arr.
Topics dealing with current problems or developments in chemical and materials engineering. May be repeated. Prerequisite: graduate standing.

567:296 Advanced Topics in Structural Engineering arr.
Topics dealing with current problems or developments in structural engineering. May be repeated. Prerequisite: graduate standing.

567:297 Advanced Topics in Mechanics arr.
Topics dealing with current problems or developments in mechanics. May be repeated. Prerequisite: graduate standing.

567:299 Research: Materials Engineering, Ph.D. Thesis arr.
Experimental and analytical investigation of an approved problem leading to a Doctor of Philosophy degree. Prerequisite: consent of program chair and major adviser.

Division of Systems Engineering

Chair: J.M. Littschwager
Faculty: *professors* J.W. Deegan, J.M. Littschwager, J.S. Ramberg, J.R. Simon
professor emeritus M.L. Batterley
assistant professors D.L. Bricker, M. Chandra, C.R. Standridge, J.W. Stoner
instructor D.R. Heltne

The Division of Systems Engineering is an administrative division of the College of Engineering which develops, coordinates, and administers teaching, laboratories and research in areas associated with large-scale systems analysis and design. Faculty of the Division develop and provide courses primarily in support of the undergraduate and graduate degree programs offered by the Program in Industrial and Management Engineering, the transportation portion of the Civil Engineering degree program, and the College undergraduate core curriculum.

Research interests of the faculty are centered in areas associated with engineering management, human factors, operations research, engineering statistics, optimization, computing and transportation planning. Specific research projects recently completed, or ongoing, include the study of linearly constrained optimization problems with economies of scale, the use of discriminant analysis in medical decision making, the development of mathematical models for public utility rate design,

extensive studies concerning auditory and visual displays, human engineering studies of three compact autos and the development of computerized systems for county equipment cost records, legislative districting and a transit system evaluation package.

Facilities

The Division of Systems Engineering is responsible for development and supervision of the Engineering College's Computer Based Education (CBE) Laboratory. This laboratory provides on-line interaction with the University's computer systems via video display and hard copy terminals. The laboratory also contains other commonly used computer accessory equipment such as keypunches and line printers, as well as video equipment for instructional purposes.

The Division occupies newly remodeled fourth floor space of the Engineering Building. Spacious teaching laboratories and graduate student offices are provided.

Financial Aids

The Division of Systems Engineering offers a number of quarter-time and half-time graduate research assistantships through grant and contract funds available to faculty of the division. Selection is based on academic competence and the research needs of the Division. Research support is also available through Graduate College funds and allied research programs such as the Institute of Urban and Regional Research. Advanced graduate students may also qualify for higher stipend instructor positions.

Courses

Core Engineering Program Courses

580:1 Introduction to Engineering 2 s.h.
Survey of various branches of engineering; the engineering approach to problem solving; engineering design projects requiring creativity, analysis, and synthesis; oral and written reporting.

580:3 Engineering Graphics 2 s.h.
Basic graphics concepts necessary in contemporary engineering including orthographic projection, geometric construction, pictorial representation, auxiliary views, sectioning, dimensioning, graphs and empirical equations, lines and planes, and vectors.

580:4 Engineering Computations 3 s.h.
Digital computer programming utilizing FORTRAN and time-shared BASIC; engineering applications using logic operations, decision and transfer, loops, subprograms, input-output, and flow charts.

580:21 Principles of Design I 3 s.h.
Emphasizes two-to-three-week projects involving the identification, modeling and analysis of design problems using optimization principles, methodology and computer-aided design. Prerequisite: 540:12, 22M:38.

580:22 Principles of Design II 3 s.h.
Probabilistic and statistical aspects of engineering design; topics include Monte Carlo, discrete event simulation, model construction and their application to engineering design. Prerequisite: 580:21, 580:39.

580:27 Engineering Management Science 3 s.h.
Aspects of management science particularly suitable for administration of the engineering function; coverage includes economics of an enterprise, evaluation of tactical and strategic alternatives, project and resource scheduling, decisions under risk and uncertainty. Fall. Prerequisite: Sophomore standing.

580:39 Probability and Statistics for Engineering and Physical Sciences 3 s.h.
Finite probability models, random variables, important discrete and continuous distributions, descriptive statistics, point and interval estimation, tests of hypotheses, regression. Prerequisite: 22M:36 or equivalent. Same as 22S:39.

General Courses

587:101 Communication in Industry I 3-4 s.h.
Introduction to communication methods within groups of people, from work groups to large organizations, and to principles involved in effectively exchanging information in industry through various channels available; conducted as seminar in group activity, with knowledge obtained by reading, with practice derived from interacting within group, with applications and feedback drawn from working on self-chosen projects; fourth hour earned by writing well-prepared and well-supported paper or report. Prerequisite: Senior standing.

587:102 Communication in Industry II 3-4 s.h.
Practice in application of knowledge of group interaction and of principles of human communication through advising groups about communicating in various engineering courses; further learning and useful feedback derived from seminar meeting held for exchange of ideas resulting from advising practice and from required reading selected by each student; fourth hour earned by writing well-prepared and well-supported paper or report on study connected with advisory work. Spring. Prerequisites: 587:101 and consent of instructor.

587:105 Lettering 1 s.h.

587:107 Mechanical Drawing 2 s.h.
Fundamentals of mechanical drawing, primarily for correspondent students without previous experience. Sixteen lessons and final exam.

587:201 Communicating Technical Information 3 s.h.
Discussion and application of principles of interpersonal communications, and review of the structure and idiom of the English language; consideration of media and forms appropriate for reporting technical information; practice in speaking and in writing articles, reports, theses and dissertations. Fall.

Design and Engineering Management Courses

586:121 Design of Work Methods 3-4 s.h.
Problems of analysis and design encountered in integrating humans into productive systems; emphasis on methods and measurements. Fall. Prerequisites: 580:27, 580:22.

586:124 Operational Systems Design 3-4 s.h.
Projects involving analysis, measurement, design and evaluation of a new or improved operating system in an industrial, educational, or governmental organization. Aspects of starting a new business or enterprise. Spring. Prerequisite: 586:121.

586:127 Engineering Management Science 3 s.h.
Aspects of management science pertaining to the engineering function for advanced level students; coverage includes economics of an enterprise, evaluation of tactical and strategic alternatives, project and resource allocation and scheduling decisions under risk and uncertainty. Individual assignments required. Fall. Prerequisite: junior or graduate standing.

586:128 Engineering Administration I 3 s.h.
Human and economic factors; related behavioral science research, incentives, nature of the engineering function. Spring. Prerequisite: 586:127.

586:129 Information Systems Design 3 s.h.
Structure and design of computer-based management information systems; concepts of computer hardware, software, communication networks, and file structures; methods used in system design; case studies; managing the system. Fall. Prerequisite: programming experience.

586:228 Engineering Administration II 3 s.h.
Methods for organizing, planning, funding and controlling engineering efforts. Individual assignments required. Summer. Prerequisite: 586:128.

586:229 Software Systems for Management Science 3 s.h.
Advanced concepts of computer systems as related to management problems; overview of operating system facilities, file organizations for large data bases, the management of software projects, documentation, and techniques for software design, testing, and implementation. Spring. Prerequisites: programming experience; 586:129 or consent of the instructor.

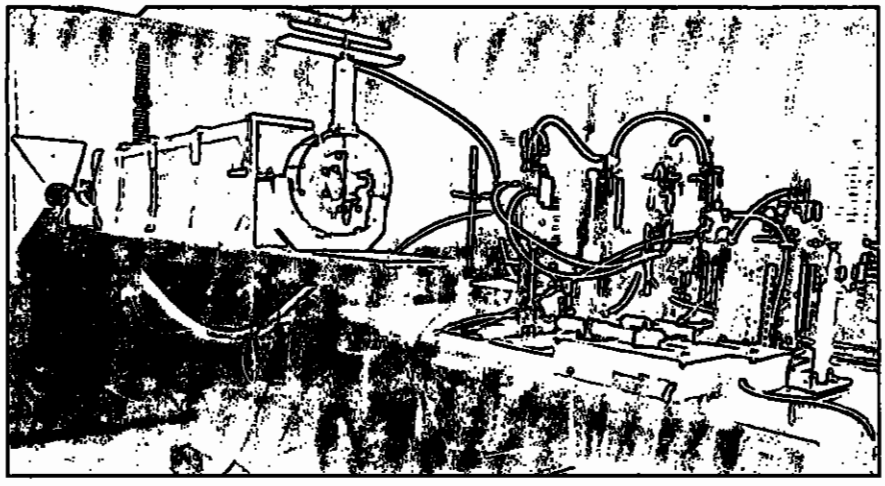
Engineering and Applied Statistics Courses

586:131 Statistical Methods with Applications 3 s.h.
Probability models, random variables, functions of random variables, expectations, joint distributions, estimation, hypothesis testing, regression. Fall. Same as 22S:131.

586:133 Quality Control, Reliability and Engineering Statistics 3 s.h.
Basic control charts, sampling inspection and acceptance sampling, power curves, reliability estimation for components and systems. Spring. Prerequisite: 22S:39 or 586:131. Same as 22S:133.

586:231 Analysis and Design of Experiments 4 s.h.
Models in analysis of variance, single-factor multiple comparisons, blocking, multiple factors: crossed, nested, and repeated-measures design, Latin squares, mixed models, unbalanced experiments, split-plot designs, fractional factorial designs, response surface methodology. Spring. Prerequisite: 22S:120, 22S:131, or 22S:154. Same as 22S:158.

586:232 Regression Analysis 3 s.h.
Analysis of multiple linear regression models, residual



analysis, variate selection, simultaneous inference, robust procedures. Spring. Prerequisite: 22S:39, 586:131, or 22S:154. Same as 22S:162.

Operations Research Courses

586:140 Quantitative Methods 3 s.h.
Topics from discrete mathematics leading to useful modelstions research; elements of linear algebra and matrix theory, finite differences and difference equations, discrete transforms and elementary numerical methods. Fall. Prerequisite: 22M:38.

586:141 Introduction to Operations Research 3 s.h.
Topics and algorithms from operations research including linear and dynamic programming, queueing, and inventory theory. Prerequisite: Graduate standing or 586:140.

586:142 Production Inventory Models 3 s.h.
Study of mathematical models, operations research methodology, and computer-based systems for production planning, controlling inventory levels and forecasting product demand. Spring. Prerequisites: 586:141, 22S:39.

586:143 Quantitative Investment Analysis 3 s.h.
Investment criteria, benefit analysis, replacement and capacity expansion models, capital budgeting and portfolio analysis, models of risk and uncertainty. Fall. Prerequisites: 586:14,22S:39.

586:147 Sequencing and Scheduling 3 s.h.
Sequencing and scheduling in production, computer and other complex systems; topics include sequencing and scheduling of flow shops and job shops, assembly line balancing, line of balance, CPM, PERT and simulation models for complex job shops. Spring. Prerequisite: 22S:39; corequisite: 586:141.

586:149 Digital Systems Simulation I 3 s.h.
Simulation of complex systems using digital simulation languages; topics include Monte Carlo, model construction, and the analysis of input and output for simulation studies. Fall. Prerequisites: programming experience and 22S:39.

586:242 Mathematical Programming I 3 s.h.
Study of mathematical models, theory and algorithms for constrained and unconstrained optimization; emphasis on linear optimization including variants of the simplex method, post-optimality analysis, separable programming, transportation and network problems, and duality theory. Fall. Prerequisite: 586:141.

586:243 Mathematical Programming II 3 s.h.
Topics include nonlinear, geometric and quadratic programming, decomposition of large-scale problems, aspects of duality theory and other current topics in the field. Spring. Prerequisite: 586:242.

586:245 Stochastic Service Systems I 3 s.h.
Stochastic-based problems in queueing, renewal, and other service systems. Emphasis on Poisson-type queues. Spring. Prerequisite: 586:131, 586:141 or equivalent.

586:248 Integer Programming and Network Flows 3 s.h.
Theory, applications, and algorithms for integer and mixed-integer mathematical programming. Algorithms include cutting plane, implicit enumeration, branch and bound, partitioning, and group theoretic. Study of network, fixed charge, facility location and set covering problems. Summer. Prerequisite: 586:242 or consent of instructor.

586:249 Digital Systems Simulation II 3 s.h.
Continuation of 586:149 using advanced simulation lang' ages; emphasis on the statistical aspects of simulation including random variate generation and advanced methods for analyzing simulation output. Spring. Prerequisite: 586:149 or consent of instructor.

Human Factors Courses

586:155 Human Engineering 3 s.h.
Design of man-machine systems and development of optimum work environment by applying principles of behavioral science; emphasis on sensory and perceptual processes, motor skills, experimental methodology. Spring. Same as 31:155.

586:156 Psychology in Management 3 s.h.
Application of psychological principles to human relations and supervision; discussion of motivation, leadership, communication, group pressures, other topics. Fall. Same as 31:156.

586:157 Advanced Managerial Psychology 2-3 s.h.
Discussion of selected recent literature on managerial psychology. Fall, every other year. Prerequisite: 586:156.

586:255 Advanced Human Factors 2-3 s.h.
Discussion of selected research areas in human factors engineering. Fall, every other year. Prerequisite: 586:155.

Transportation Courses

583:73 Transportation Engineering I 3 s.h.
Location and design of routes of transportation, operation of rural and urban roads, streets and expressways, intersection design and evaluation, traffic engineering and transportation systems management. Spring. Prerequisite: 583:73. Corequisites: 580:21, 22S:39.

583:74 Transportation Engineering II 3 s.h.
History of transportation, regulation and control of services, economic analysis, and related public policies. Design considerations for existing modes of transport as well as proposed technologies and new systems.

583:173 Transportation Systems Design 3 s.h.
Design, construction, and operational planning projects for integrated transportation systems. Includes topics in street system, mass transit, and terminal facility design. Team design projects. Spring or summer. Prerequisite: 583:74 or course work similar to 587:272.

587:272 Urban Transportation Planning 3 s.h.
Application of city planning procedures and traffic engineering techniques to the generation of solutions to transportation problems; travel characteristics, forecasting methods, trip generation, distribution and assignment models. Fall.

Seminars, Advanced Topics, Research

586:91 Professional Seminar 0-1 s.h.
Professional seminar for undergraduate juniors and seniors in Industrial and Management Engineering. Guest lectures, field trips, student reports and assemblies. May be repeated. Fall, spring.

587:98 Individual Investigations arr.
Independent investigations for undergraduate students. Fall, spring. Prerequisite: consent of a supervising instructor.

587:190 Readings arr.
Using this registration, qualified graduate students who are not related majors may receive credit for certain undergraduate courses offered by the division. Fall, spring.

587:195 Advanced Topics arr.
Advanced topics in systems engineering. Offerings based on student interest.

587:198 Individual Investigations arr.
Individual investigations by senior undergraduate or graduate students. Fall, spring. Prerequisite: consent of a supervising instructor.

586:291 Graduate Seminar arr.
Professional seminar for graduate students in Industrial and Management Engineering. Guest lectures, student reports and assemblies. Fall, spring.

587:294 Advanced Topics: Engineering Management and Human Factors arr.
Advanced topics in engineering management or human factors. Offerings based on student interest.

587:295 Advanced Topics: Engineering Statistics, Quality Control and Reliability 3 s.h.
Advanced topics in quality control, engineering statistics and reliability. Offerings based on student interest.

587:296 Advanced Topics: Operations Research arr.
Advanced topics in operations research. Offerings based on student interest.

587:297 Advanced Topics: Transportation arr.
Advanced topics in transportation. Offerings based on student interest.

587:298 M.S. Research arr.
Research at the master's level, primarily for the M.S. thesis.

587:299 Ph.D. Research arr.
Research at the Ph.D. level, primarily for the Ph.D. dissertation.

Graduate College

Administrative staff: Duane C. Spriestersbach
Dean for Advanced Studies Rudolph W. Schulz
Associate Deans James F. Jakobsen, Charles M. Mason
Graduate Examiner Mary Palmberg
members of the Graduate Council Julia Davis (Speech Pathology and Audiology), John Donelson (Biochemistry), Avijit Ghosh (graduate student), Noah Hershkowitz (Physics and Astronomy), Robert Hogg (Statistics), James Murray (Political Science), James Price (Sociology), Greg Schmidt (graduate student), J. Richard Simon (Psychology/ Engineering), Eugene Spaziani (Zoology), James Wamsley (graduate student), Douglas Whitney (Education)

Faculty

The graduate faculty comprises University faculty and administrative personnel in the ranks of assistant, associate and full professor. A 12-member Graduate Council, elected from and by the graduate faculty and the Graduate Student Senate, is the executive committee of that body and is advisory to the dean of the Graduate College.

The Graduate College

The University of Iowa has been a leading center of advanced study for three-quarters of a century. Presently, one-fourth of its enrollment is in the Graduate College. This unusually high ratio reflects the breadth of the University's graduate programs and resources, the strength of a graduate faculty with a long tradition of personal and professional concern for students and the opportunities afforded graduate students for involvement, recognition and support.

Graduate courses are offered in all colleges of the University, both professional and nonprofessional. The Graduate College provides the framework through which graduate degree programs are supervised and coordinated.

The Graduate College is responsible for the review and approval of proposals for new graduate programs and for the periodic survey and evaluation of existing programs. Through its administration of scholarship, fellowship and research funds, the Graduate College encourages research and strengthening of departments. It offers extensive assistance to individual faculty members in finding the resources necessary for research projects. The Graduate College works with the departments and other colleges of the University in the formulation of policies concerning selection and in the supervision and support of graduate students.

The University of Iowa has a long history of not only promoting, but strictly adhering to the ideas of equal access to educational opportunity at the undergraduate, graduate and professional level. The Graduate College, in cooperation with the Department of Special Support Services, is involved in an extensive outreach effort to identify and attract to The University of Iowa persons from minority, low-income and culturally or socially distinct backgrounds.

Advanced Degree Programs

The University offers graduate programs leading to the Master of Arts, Master of Science, Master of Business Administration, Master of Arts in Teaching and Master of Comparative Law degrees; the two-year degrees, Master of Fine Arts, Educational Specialist and Master of Social Work; and the Doctor of Philosophy and Doctor of Musical Arts degrees.

The Graduate College currently confers degrees in the following major fields:

Accounting—M.A.*
Afro-American Studies— M.A.*
American Studies—M.A.*, Ph.D.
Anatomy—M.S., Ph.D.
Anthropology—M.A.*, Ph.D.
Applied Mathematical Science—Ph.D.
Art—M.A., M.F.A.
Art History—M.A.*, Ph.D.
Asian Civilization— M.A.
Astronomy—M.S.*
Biochemistry—M.S., Ph.D.
Biology—M.S.*
Botany—M.S.*, Ph.D.
Business Administration—M.A.*, M.B.A.**, Ph.D.
Business Education—M.A.*, Ph.D.
Chemical and Materials Engineering—M.S., Ph.D.
Chemical Physics—M.S., Ph.D.
Chemistry— M.S.*, Ph.D.
Chinese Language and Civilization—M.A.* ***
Civil and Environmental Engineering—M.S.*, Ph.D.
Classics—M.A.**, Ph.D.
Community Dentistry—M.S.
Comparative Law—M.C.L.***
Comparative Literature—M.A.*, Ph.D.
Computer Science—M.S.*, Ph.D.
Criminal Justice and Corrections—M.A.**
Dental Hygiene—M.S.
Dramatic Art—M.A.*, M.F.A., Ph.D.
Economics—M.A.*, Ph.D.
Education—M.A.*, M.A.T.**, Ed.S.**, Ph.D.
Electrical and Computer Engineering—M.S.*, Ph.D.
English—M.A.*, M.F.A., Ph.D.
Environmental Engineering—M.S.* ***, Ph.D.***
Fixed Prosthodontics—M.S.
French—M.A.*, Ph.D.
Genetics—Ph.D.
Geography—M.A.*, Ph.D.
Geology—M.S.*, Ph.D.
German—M.A.*, Ph.D.
Greek—M.A.**
History—M.A.*, Ph.D.
Home Economics— M.A.*, M.S.*
Hospital and Health Administration—M.A.*, Ph.D.
Industrial and Management Engineering—M.S.*, Ph.D.
Journalism—M.A.*
Latin—M.A.**

Library Science—M.A.*
Linguistics—M.A.*, Ph.D.
Mass Communications—Ph.D.
Mathematics— M.S.*, Ph.D.
Mechanical Engineering—M.S.*, Ph.D.
Mechanics and Hydraulics—M.S.* ***, Ph.D.***
Microbiology—M.S.,Ph.D.
Museum Methods—M.A.***
Music—M.A.*, M.F.A., D.M.A., Ph.D.
Nuclear Science and Technology—M.S.* ***
Nursing—M.A.**
Nutrition—M.S.* ***, Ph.D.***
Operative Dentistry and Endodontics—M.S.
Ophthalmology—M.S.
Oral Pathology—M.S.
Oral Surgery—M.S.
Orthodontics—M.S.
Otolaryngology—M.S.
Pathology—M.S.
Pedodontics—M.S.
Periodontology—M.S.
Pharmacology—M.S., Ph.D.
Pharmacy—M.S.*, Ph.D.
Philosophy—M.A.*, Ph.D.
Physical Education—M.A.*, Ph.D.
Physical Therapy—M.A.
Physics—M.S.*, Ph.D.
Physiology and Biophysics—M.S., Ph.D.
Political Science— M.A.*, Ph.D.
Preventive Medicine and Environmental Health—M.S.*, Ph.D.
Psychology—M.A.*, Ph.D.
Public Affairs—M.A.**
Radiation Biology—M.S., Ph.D.
Recreation Education—M.A.*
Religion—M.A., Ph.D.
Removable Prosthodontics—M.S.
Russian—M.A.*
Science Education—M.S.*, Ph.D.
Social Studies—M.A.*
Social Work— M.S.W.**
Sociology—M.A.*, Ph.D.
Spanish—M.A.*, Ph.D.
Speech— M.A.*, Ph.D.
Speech and Dramatic Art—M.A.*, Ph.D.
Speech Pathology and Audiology—M.A.*, Ph.D.
Statistics—M.S.*, Ph.D.
Urban and Regional Planning—M.A.*, M.S.*
Zoology—M.S.*, Ph.D.

*Degree offered with or without thesis

**Nonthesis degree

***Student entry suspended

Research Resources

The many and diverse research activities of the University are centrally administered by the Office of the Vice-President for Educational Development and Research, which has an interlocking relationship with the Graduate College. For further information on the research resources of the University, see "Research Activities."

Financial Assistance

Approximately half of the University's graduate students receive some form of University-administered financial assistance. Eligibility requirements and application procedures are set forth in "Section VII. Graduate Appointments" in "Rules and Regulations of the Graduate College."

These are the primary sources of assistance:

Teaching and Research Assistantships

Available in most departments; stipends range between $4,400 and $4,900 for half-time assistants; assistants are also eligible for tuition scholarships; nonresident assistants' (one-quarter time or more) tuition and fees are reduced to resident rates.

University Teaching-Research Fellowships

For first-year graduate students entering doctoral programs; typical stipends of $5,800 a year on a year-around basis, for as many as four years; recipients have teaching and research assignments, but may carry full course loads at the same time; one year out of four and all summers, recipients have full time to pursue studies, research or writing.

Scholarships

Up to full tuition and fees.

Graduate Fellowships

$4,000 for the academic year.

Other Sources

University and National Defense student loans are available through the University's Office of Student Financial Aids.

Many departments offer additional support through traineeships, part-time employment in research or part-time teaching appointments. The Office of the Vice-President for Educational Development and Research maintains a library of information on public and private agencies which provide funds for research and graduate study. A considerable amount of material has been collected concerning awards for overseas study.

Graduate Student Senate

The Graduate Student Senate is the University graduate student body's representative organization. Representatives are elected annually from each department of the University having a graduate degree program. The Senate's primary purpose is to serve the interests of the graduate student body in matters affecting its welfare. The senate advises the Graduate Dean on matters pertaining to the Graduate College.

Rules and Regulations of the Graduate College

The Academic Program

Section I. Admission to the Graduate College

A. Application Procedure

All students seeking to register for the first time in the Graduate College of The University of Iowa must secure a formal admission statement from the director of admissions. Applicants may obtain the proper forms from the Director of Admissions, The University of Iowa, Iowa City, Iowa 52242.

In addition to these forms, the official transcripts from each undergraduate and graduate institution attended must be submitted to the director of admissions by the designated deadline prior to the session in which admission is expected. Admission applications must arrive no later than July 15 for first-semester enrollment, December 1 for second-semester enrollment or May 1 for summer-session enrollment. These are general Graduate College deadlines. Individual departments may establish earlier admission cutoff dates.

B. Graduate Record Examination

All applicants prior to consideration for admission should take the Aptitude Test of the Graduate Record Examination (GRE) or, for applicants to graduate programs in business administration, the Graduate Management Admission Test (GMAT). Applicants for whom admission data are complete, with the exception of scores on the GRE or the GMAT, may, dependent on departmental policy, be admitted if they meet all other requirements. The GRE, or the GMAT, must be taken within one semester after registration. The test is given several times a year at test centers established under the direction of Educational Testing Service, Princeton, New Jersey. The judgment of acceptable levels of performance on this test and its weight in the decision on admission of a student is left to the departments. Some departments in fields where GRE Advanced Tests are

available require these in addition to the Aptitude Test. Inquiries about the Aptitude Test may be directed to University Evaluation and Examination Service; and inquiries about the requirement of the Advanced Test should be addressed to the executive of the department in which the applicant is interested.

C. English for Foreign Students

Prior to consideration for admission, foreign student applicants whose native language is other than English must take and pass TOEFL (Test of English as a Foreign Language), unless they have received a degree from an accredited college or university in the United States, the United Kingdom, Canada (except Quebec), Australia, or New Zealand. The examination is given at various times of the year and in many centers throughout the world. Inquiries should be addressed to the Director, TOEFL, Educational Testing Service, Princeton, New Jersey 08540.

Foreign students transferring from unfinished degree programs of other universities in the United States who have not taken this examination, or who have received a grade lower than the minimum established by the Graduate Dean, must take the TOEFL examination and receive a passing grade prior to consideration for admission.

The Graduate College will advise the departments of those students barely passing the TOEFL test. Individual departments may require such students to take and pass a course at The University of Iowa in English usage designed especially for foreign students.

D. Early Admission

A student who is within four semester hours of having satisfied all the requirements for the bachelor's degree at The University of Iowa or any other accredited college may be given conditional admission.

E. Candidacy

Admission to the Graduate College is not the equivalent of acceptance as a candidate for an advanced degree, which must be earned through work successfully completed at The University of Iowa. (See "Section X. Master's Degrees," and "Section XII. Doctor's Degrees.")

F. Declaration of Major and Degree

Every applicant for admission must indicate on the application form the department or degree program or certificate program of his or her major interest and the degree, certificate or professional objective he or she intends to pursue. The only exceptions to this regulation are the limited number of applicants registered as "special students." (See definition of "special status" in next paragraph.) Changes in the major or degree status may be made in the course of a student's graduate study with the approval of the department to which the transfer is proposed. To initiate such action the student must file a change of major or degree status in the Office of Admissions.

G. Status upon Admission

All students upon admission fall into one of the following categories:

1. *Regular*—Students who have met the minimum requirements for admission and who have been accepted by a department, or interdepartmental degree program, for work leading to a graduate degree or certificate or professional improvement.

2. *Conditional*—Students who are interested in working toward a graduate degree or certificate but who are required by a department to demonstrate their ability to do satisfactory graduate work before being admitted to regular status. To be admitted on a conditional basis, the student must be recommended by a department, which will assume responsibility for advising him or her. (See minimum grade-point requirements, "Section I.H.") The student on conditional status must achieve regular status within two sessions of registration in the Graduate College by attaining a grade-point average of at least 2.50 and acceptance by the major department, or be dismissed.

3. *Special*—Students in receipt of a valid bachelor's degree who wish to register for no more than two courses at a time and who are not planning to become candidates for a graduate degree or certificate. These students, relatively few in number, must obtain special permission to register from the Director of Admissions. Special graduate students are not eligible for a graduate degree or for a certificate in a certificate program.

4. *Summer Session*— Students with a valid bachelor's degree and at least a 2.3 grade-point average may register for only one summer session without being accepted by a department or college. (See "Section H" below.) The deadline for application for admission to the summer session will be determined by the director of the summer session and the Director of Admissions. Before admission to any subsequent session, including another summer session, the student must file an application and be admitted to regular or conditional status.

H. Minimum Requirements for Admission

Graduates of any college or university accredited by regional accrediting associations may be admitted to the Graduate College if their academic records meet the required standards. At the master's level, a minimum grade-point average of 2.3 is required for admission to conditional status. A minimum of 2.5 is required for admission to regular status. The grade-point average is computed only on graduate work if the student has completed at least 12 graduate hours. If the student has not completed 12 graduate hours, the grade-point average is computed upon the undergraduate and graduate work completed. In cases in which a student applying for admission has a grade-point average below the minimum required, but has a Graduate Record Examination score above a point to be designated by the Graduate Dean, his or her papers shall be forwarded to the department concerned for examination and decision.

Students applying for admission to a doctoral program with 12 or more semester hours of graduate work must meet a minimum of GPA of 3.0 on the graduate work. For students with less than 12 semester hours of graduate work, a minimum of 2.7 is required on the entire record of collegiate work.

Departments, or committees in charge of interdepartmental degree programs, may, and often do, set higher minimum admission requirements than those set forth above for the University as a whole. Information concerning departmental or program requirements may be obtained directly from the executive of the department concerned.

For State Board of Regents' formal admission requirements, see "Appendix" of the *Catalog*.

I. Admission of Faculty Members to Graduate Study

Persons who hold faculty rank of assistant professor (including clinical assistant professor) or above at The University of Iowa may be admitted as special students. (See "Section G" above.) A person holding faculty rank as specified above may petition the

Graduate Dean for permission to enter a departmental program for work leading to an advanced degree, certificate or professional improvement except in the department of his or her appointment or closely related departments. Such petitions must have prior approval of the department of appointment, dean of the college of appointment, the department in which study is to be pursued and the Graduate Council.

Section II. Registration

A. Standard Schedule

Students registered in the Graduate College may register for no more than 15 semester hours of credit in graduate courses. In a schedule of mixed graduate and undergraduate courses, two hours of undergraduate credit may be substituted for one hour of graduate credit, with registration limited to a total of 18 semester hours. This applies to the calculation of academic load only. Graduate credit is not given for courses numbered under 100. The maximum for the eight-week summer session is eight semester hours, or nine semester hours if two or more semester hours of undergraduate work are included.

The maximum semester hour registration for work scheduled outside of the regular 8-week summer session will be arranged on a basis proportionate to that stated above with the approval of the Graduate Dean. Nine semester hours in the regular session constitutes full-time registration. (Fellows are required to carry at least nine semester hours during a semester as a condition of their appointments.) One-quarter-time and one-third-time appointees are permitted to register for the maximum 15 semester hours per semester and eight semester hours during the eight-week summer session.

B. Courses Not Included in Total Registration

In addition to a full schedule, a graduate student may register for courses printed in the *Schedule of Courses* as carrying no semester hour credit.

C. Changes in Announced Credit

Graduate students may not register for more credit in any course than that printed in the *Schedule of Courses*, but may register for less credit, or no credit, by permission of the instructor. The number of courses a graduate student may take for limited or no credit is subject to the consent of the adviser and the approval of the Dean of the Graduate College.

D. Reduced Schedules for Teaching and Research Assistants and Other Appointees

1. One-half-time appointees may register for not more than 12 semester hours during a semester or six semester hours during the eight-week summer session.

2. Five-eighths-time appointees may register for not more than 10 semester hours during a semester or five semester hours during the eight-week summer session.

3. Two-thirds- and three-quarter-time appointees may register for not more than nine semester hours during a semester or five semester hours during the eight-week summer session.

4. Seven-eighths-time appointees may register for not more than seven semester hours during a semester or four semester hours during the eight-week summer session.

5. Full-time appointees, including full-time instructors, may register for not more than six semester hours during a semester or three semester hours during the eight-week summer session.

E. Retroactive Registration

No form of retroactive registration is permitted.

F. Registration for Part of a Semester

A graduate student may register at any time during the semester or the 8-week summer session for not more than one semester hour of credit for each of the remaining weeks of classes (not including the examination period) in the term. The total registration may not exceed the 15 semester hours permitted for a semester and the eight semester hours permitted for the 8-week summer session. Registration after the last day of the third week of a semester or the third day of the second week of a summer session is permitted only in courses involving special projects, readings, individual study, thesis or research, with the signed approval of the instructor concerned and the Graduate Dean.

G. Extramural Registration

After admission to the Graduate College, registration for work done off campus is accepted for residence credit under the following circumstances:

1. Traveling Scholar Program of the Committee on Institutional Cooperation (see "Section III").

2. Research at approved locations under the direction of members of the graduate faculty at The University of Iowa.

3. Field work as part of a regularly scheduled course or research program.

4. Courses taught off campus by members of the graduate faculty (see "Section X.D" and "Section XII.C" for minimum semester hours required on campus for the master's and doctor's degrees).

5. Residence graduate credit from another Iowa Regents' University (see "Section V.B").

6. As many as nine semester hours of graduate work taken at the Quad-Cities Graduate Center from faculty other than faculty of the Iowa Regents' Universities, provided the work is acceptable to the student's major department for the specified degree.

Extramural registration does not count toward residence credit in the following circumstances:

1. Coursework transferred from another institution; and

2. Correspondence courses.

H. Extramural Fees and Privileges

Students registered for extramural courses for graduate residence credit must apply for admission to regular status (see "Section I.G") and pay established fees. (See "Section XII.K" for special fees applicable to post-comprehensive registration, which should not be confused with extramural registration for residence credit.)

I. Correspondence Courses

Correspondence study credits do not count as residence credits. Graduate correspondence study credit earned prior to a student's acceptance as a degree candidate at The University of Iowa may be counted toward an advanced degree upon the approval of the appropriate college or department. Not more than nine semester hours of graduate correspondence work can be accepted for credit for an advanced degree. Such credit must be acceptable for the student's Plan of Study and must be earned after the student has attained graduate status. A student enrolled for residence credit may not register for correspondence courses without the ap-

proval of the executive of his or her major department and of the Graduate Dean.

J. System of Course Numbers

Courses primarily for graduate students are numbered 200 or above in each department. Courses open to and carrying credit for both graduate and undergraduate students are numbered from 100 to 199. Courses below 100 are not accepted for graduate credit.

K. Auditing of Courses

In special cases, and upon the recommendation of the instructor and the adviser, the dean of the Graduate College may grant permission to graduate students to audit courses for no credit. Auditing is permitted only to a student who is currently registered.

L. Dropping of Courses

All graduate students who drop courses after the deadline date established by the dean of the Graduate College for each session and published by the registrar shall receive the grade of F unless the entire registration is canceled. This regulation may be waived only by the graduate dean on the recommendation of the Student Health director or the Student Counseling Service. If a student cancels registration after the deadline date, he or she must obtain permission from the dean of the Graduate College before he or she is permitted to reregister.

Section III. Traveling Scholar Program

A. Purpose

The program under the auspices of the Committee on Institutional Cooperation representing 11 universities in the Midwest enables a doctoral student to take advantage of special resources available on another campus but not available on his or her own campus: special course offerings, research opportunities, unique laboratories and library collections.

B. Procedure

1. A CIC Traveling Scholar first must be recommended by his or her own graduate adviser, who will approach an appropriate faculty member at the possible host institution in regard to a visiting arrangement.

2. After agreement by the student's adviser and the faculty member at the host institution, graduate deans at both institutions will be fully informed by the adviser and have the power to approve or disapprove.

3. A CIC Traveling Scholar will be registered at the home university, and fees will be collected and kept by that institution.

4. Credit for the work taken will be recorded at the home university.

5. Those desiring additional information should inquire at the office of the Graduate College.

C. Conditions

CIC Traveling Scholars will normally be limited to two semesters or three quarters on another campus. Each university retains its full right to accept or reject any student who wishes to study under its auspices.

Section IV. Academic Standing, Probation and Dismissal

A. Master's, Specialist, Certificate, or other Nondegree Students

A student on regular status shall be placed on probation if, after completing eight semester hours of graduate work, his or her cumulative grade-point average on graduate work done at The University of Iowa falls below 2.50. If, after completing eight more semester hours of graduate work at this University, his or her grade-point average remains below 2.50, he or she shall be denied permission to reregister; otherwise, the student shall be restored to good standing.

B. Doctoral Students

A doctoral student on regular status shall be placed on probation if, after completing eight hours of graduate work, the student's cumulative grade-point average on graduate work done at The University of Iowa falls below 3.00. If, after completing eight more semester hours of graduate work at this University, the student's cumulative grade-point average remains below the required level, the student shall be dropped from the program and denied permission to reregister unless he or she applies and is accepted for another degree or certificate program. If the condition of probation is met, the student is returned to good standing.

C. Restriction on Students on Probation

A student on probation shall not be permitted to take comprehensive or final examinations leading to any degree or certificate, nor may the student receive any graduate degree or certificate.

D. Departmental Regulations and Dissemination of Information

In addition to the above University-wide requirements, departments may establish further requirements which then determine the individual student's standing with regard to probation and dismissal. To this end, each department or program shall compile a written list of standards and procedures for work in that area. These documents shall be on file in each departmental office and the office of the graduate dean. Copies are to be available for students in the departmental office, and departments shall make all reasonable efforts to inform students. Subsequent changes in standards or procedures shall be communicated by the department to each student and the graduate dean. Whenever departments revise standards for a given program, the new regulations will not apply retroactively to the disadvantage of those already in the program. In addition to notifying students that they are subject to the rules of the Graduate College as set forth in the *Manual of Rules and Regulations*, any standards established by the department more stringent than the general Graduate College requirements shall be stated. Information shall be provided outlining required courses applicable to the various departmental programs of study, examination procedures and other formal evaluations, departmental policies with regard to awarding and renewing assistantships, time limits on programs of study, departmental registration policies, departmental grade-point requirements, requirements for changing from one degree program to another within the department, especially from the master's to the Ph.D., departmental probation and dismissal policies and procedures (see E following), and such other matters as are appropriate. The nature of the departmental advisory system shall be explained to the incoming students.

E. Academic Progress, Departmental Probation, and Dismissal Procedures

If a student is failing to meet departmental standards, the department shall warn the student of this fact in writing. The notification shall specify in what way(s) the student is failing to meet the standards. The student shall be provided a reasonable amount of time to meet the standards prior to departmental dismissal. If, in its monitoring of a student's progress, conditions such as

conditional admission or probation are imposed, the department shall give at the time of its imposition written explanation of this status and its time limits.

A student who will not be permitted to reregister for failure to meet standards shall be notified of this fact in writing with reasons for the action provided. Such dismissal may follow failure to meet conditions of admission, conditions of probation, pre-announced departmental grade-point requirements or other standards, or failure of a regularly scheduled examination or formal evaluation. If a student judges the dismissal decision improper, the student has a right to review. Each department shall establish procedures for handling such reviews. The procedures are to be approved by the Graduate Dean, and shall afford a fair and expeditious review. A description of these procedures shall be included in the departmental regulations described above. (See "Section IV.D.")

F. Graduate College Review of Departmental Dismissal

Questions involving judgment of performance will not be reviewed beyond the department level. If, however, the student feels there has been unfairness or some procedural irregularity concerning dismissal, the student may request a review by the Graduate College. This review may be conducted by the graduate dean alone, or the dean may appoint a Graduate College committee consisting of both student and faculty members to conduct the review and recommend to the dean possible courses of action. The review by the Graduate College is final.

Section V. Credits

A. Transfer of Graduate Credit

Graduate work at other institutions will be entered on the student's permanent record by the registrar and a report of this action will be sent to the student, his or her major department and the dean of the Graduate College. Credit for these courses toward an advanced degree at Iowa must have the approval of the major department and the dean of the Graduate College.

B. Residence Transfer Credit

After admission to the Graduate College, residence graduate credit from another Iowa Regents' University may be counted as residence credit in this institution, provided such work is acceptable to the student's major department on the basis of the department's determination of its applicability toward the degree. (See "Section X.D." and "XII.C" for minimum semester hours required on campus for the master's and doctor's degrees.)

C. Reduction in Credit

For courses or seminars in independent study, thesis and research an instructor may report less credit than the number of semester hours for which a student is registered.

D. Graduate Credit for Veterans

Credit may be granted for studies pursued in war and military situations under such regulations as may be formulated by the national educational agencies and under such adaptation of standing rules as the Graduate Council may authorize from time to time to meet group or individual situations. The value of such credit in satisfying requirements for a degree will be determined by the major department with the approval of the Dean.

E. Cancellation of Registration and Proportional Credit for Students Entering Military Service

1. Students who leave within the first six weeks of the semester receive no credit.

2. Students who leave within the period of seven to nine weeks receive one-half credit.

3. Students who leave within the period of 10 to 12 weeks receive two-thirds credit.

4. Grade reports for the one-half and two-thirds credit periods: (a) instructors report grades only as satisfactory or unsatisfactory; (b) credit is to be assigned on the basis of total registration minus thesis and seminar; (c) courses are to be counted toward specific degree requirements only after the student returns and then only with the department's approval.

5. Students who complete the twelfth week receive full credit.

6. Grade reports for the full credit period: (a) grades are to be reported only at the end of the semester; (b) credit is to be reported in specific courses.

7. In each instance the instructor reports the student's credit, grade and date of cancellation. No credit is granted unless the student's work is satisfactory at the time of leaving.

8. The amount of credit in thesis and research registration is to be reported to the registrar by individual instructors on the above basis except that less or no credit may be assigned.

Section VI. Marking System

A. Marks Carrying Advanced Degree Credit

These are A, B, C and S—satisfactory.

B. Marks Carrying No Credit for Advanced Degrees

These are D—poor, F—failed, I—incomplete, W—withdrawn without discredit, R—registered and U—unsatisfactory.

C. Audit

R is assigned when a student registered for no credit attends as an auditor throughout the course; if the student fails to meet the instructor's requirements for class attendance, W is assigned.

D. Incomplete

The grade of I is to be used only when a student's work during a session cannot be completed because of illness, accident or other circumstances beyond the student's control. In registrations for thesis, research or independent study, the S/U grades may be applied. (See next paragraph, "E.") Students who receive the mark of I must remove that mark within the first session of registration after the closing date of the session for which it is given, or else the grade becomes F, except that students with I's from the spring semester are exempt from completing the course during the succeeding summer session.

Specific deadlines for the submission of student work to the faculty and for the faculty's report on I grades to the registrar will be set by the graduate dean for each session and printed in the academic calendar. Courses may not be repeated to remove incompletes; removal of an I is accomplished only through the completion of the specific work for which the mark is given.

E. Thesis, Research, Readings, Independent Study and Special Projects

Grades of S and U may be used for registrations in thesis, research, readings, independent study and special projects. S—satisfactory means that the student receives credit for the work; U—unsatisfactory means that he or she receives no credit. Neither S nor U is used in computing grade-point averages. At a later

date, the instructor may change the S to a letter grade. In addition, departments may ask the Graduate Dean for permission to use grades of S and U as described above for courses which, because of their special or experimental nature, are judged to be more appropriate for such grading. In general, these requests may be granted for no more than one semester and must be reviewed by the Graduate Council before being granted for longer periods. The type of grading system to be used in the above cases should always be mutually understood by the instructor and student.

F. Grades of S and U

S and U may be used for courses taken by a graduate student outside the major department or interdepartmental degree program provided that the instructor of the course and the student's departmental adviser approve the registration. Arrangements for S/U grading in these courses are accomplished by filing a card with appropriate signatures in the Registrar's office at the time of registration, or no later than the last day of the third week of a semester or the third day of the second week of a summer session. No changes from letter grades to S/U grades or vice-versa will be allowed after these dates.

It is not the policy of the Graduate College to abandon the traditional letter grades described in this section; however, in certain exceptional instances, departments having several areas of concentration involving widely differing types of effort may request the Graduate Council for permission to allow students majoring in one area to register in courses in another area within the same department or program on an S/U basis. In these instances, S/U cards will be used as described in the preceding paragraph.

G. Computed Grade-Point Average

This is based only upon graduate work graded A, B, C, D, and F. (A=4, B=3, C=2, D=1, F=0.)

Section VII. Graduate Appointments

A. Scholarships

Scholarships are competitive and are awarded on merit.

1. Eligibility for graduate scholarships and fellowships will include: (a) registration in the Graduate College; (b) cumulative grade-point average of at least 3.0; (c) a GRE score or a GMAT score above a point to be designated by the Graduate Dean; (d) a satisfactory rate of progress in completing the program for the degree.

2. Preference will be given to candidates for the doctoral degree.

3. Recommendations for graduate scholarships may be made to the Graduate College by the appropriate department executive, director or dean. A graduate scholarship may be awarded whether or not a student holds an assistantship. The amount of scholarship for the academic year may vary, but in no case exceed the comprehensive fee assessed. Scholarships will be credited to the student's University account.

B. Graduate College Fellowships

Fellowships are awarded by the Graduate College upon recommendation by departments to students with outstanding academic records. Fellows must be registered as full-time students. The primary purpose of the awards is to permit an advanced student to complete his or her dissertation or creative project and complete the degree. Other terms of the award will be established by the graduate dean in consultation with the Graduate Council.

C. Faculty Research Assistantships

Faculty research assistantships are awarded to qualified graduate students and serve two purposes: (a) to provide research service to professional members of the academic staff and (b) to provide apprenticeship experience for graduate students who are in training in research. Not more than 20 hours of service per week are required of a half-time assistant. Other part-time service is scaled in proportion, and a limited academic schedule is permitted (see "Section II.D"). Appointments are ordinarily made for the nine-month academic year, but appointments may be made for other periods of time by special arrangement. Stipends vary with the qualifications of the appointee and the amount of service rendered. Faculty research assistants appointed by the Graduate College pay their own fees. Graduate appointments are usually made by the graduate dean upon recommendation of the various departments in March of each year, although applications may be considered at any time. Applications should be made on the form provided by the Graduate College, and should be accompanied by recommendations and/or a letter summarizing the student's qualifications.

D. Graduate Assistantships

These assistantships serve two purposes: (a) assistance in the instructional program of the University and (b) the preparation of future college teachers. In order to achieve both aims, scholastically superior graduate students who show exceptional promise as teachers are selected for graduate assistantships. All appointments are made by the dean of the appropriate college on recommendation of the department.

E. Eligibility for Scholarships, Fellowships and Research Assistantships

Scholars, fellows and faculty research assistants in the Graduate College budget must be registered as regular students in good standing in order to hold such appointments. Appointments will be terminated when registration and/or student status is terminated. In no instance may a student be promised or tendered an appointment until after approval for admission to the Graduate College by the director of admissions.

F. Dismissal of Assistants

A uniform policy defining procedures to be followed in the dismissal of assistants has been approved by the Board of Regents. Copies of this policy are available in the office of the graduate dean.

G. Research Associateships and Postdoctoral Fellowships

These provide for independent research. Appointment is made by the graduate dean upon recommendation of the department.

H. Credit

No academic credit is allowed for the teaching or research service for which the student receives payment as a graduate or a faculty research assistant.

I. Loans

Graduate students requiring financial assistance may apply for loans at the Office of Student Financial Aids. See "Scholarships and Loans" section of the *Catalog*.

J. Other Forms of Support

Many departments offer financial assistance in the form of traineeships, part-time employment on research programs or part-time teaching. Inquiries should be addressed directly to the major department.

Section VIII. Advanced Programs Offered in the Graduate College

The subject areas in which the Graduate College offers degree programs are listed under "Advanced Degree Programs" in the forepart of the "Graduate College" section of the *Catalog*.

Section IX. General Requirements for Advanced Degrees

A. Application for Degree

The student must file an application for an anticipated degree with the registrar not later than 10 weeks after the start of the semester or one week after the start of the summer session in which the degree will be conferred. The student must have the application signed by his or her adviser. Failure to file the application by that date will result in postponement of graduation to a subsequent graduation.

B. Enrollment in Final Semester

The student must be enrolled during the session in which the degree is to be conferred, except as noted in the following paragraph. Students who must register for the session in which the degree is to be conferred but are away from the University campus during that session may meet this requirement by registering for independent study, research or thesis according to the practice in the various departments. Doctoral candidates who have completed all work except the final examination may register for the postcomprehensive registration described in "Section XII.K." if such registration is appropriate. Master's candidates who have completed all work except the final examination may register for a fee equivalent to the "postcomprehensive registration," if such registration is appropriate. Registration in a correspondence course will not satisfy this requirement.

Students completing all requirements (including the final examination and thesis deposit) for a graduate degree while enrolled in the Independent Study Session may receive their degree in the following session without additional registration.

Section X. Master's Degrees

A. Kinds of Degrees

Master's programs requiring a minimum of 30 semester hours lead to the Master of Arts degree, Master of Science degree, Master of Business Administration degree, Master of Arts in Teaching degree and such other master's degrees as are approved by the graduate faculty.

B. Plan of Study

The applicant for a master's degree must file a plan of study approved by the adviser and the departmental executive with the Graduate College within the session in which the degree is to be granted and by a date to be established by the graduate dean. The plan shall meet the requirements for the degree approved by the graduate faculty. (See also "Section IV.D. Departmental Regulations and Dissemination of Information.")

C. Major and Related Fields

The plan of study should provide for reasonable concentration in the major field of interest and, subject to the approval of the major department, may include related subjects from other departments.

D. Residence Requirement

Of the minimum of 30 semester hours required for the degree, at least 24 semester hours must be completed under the auspices of The University of Iowa. After admission to the Graduate College, various forms of extramural registration may qualify toward fulfillment of this 24-hour residence requirement (see "Section II. G. Extramural Registration"), in addition to regular on-campus registration. However, at least 8 semester hours on campus are required, except for those departmental programs which ensure sufficient interaction between the students and the graduate faculty and have received approval from the Graduate Council and the dean of the Graduate College for reduction of this on-campus requirement.

E. Reduction of Old Credits

Credits for a master's degree dating back more than ten years from the session in which the degree is to be conferred are not counted toward fulfillment of degree requirements. This rule may be waived by the Dean in cases affected by military service.

F. Limit on Law, Medical or Dental Courses

Work taken by a student in the colleges of Dentistry, Law or Medicine while enrolled as a candidate for a professional degree may be counted on a graduate program of study leading to a master's degree, provided such courses were taken after the student had satisfied the requirements for the bachelor's degree, or work equivalent to the bachelor's degree at The University of Iowa. The work accepted from the professional college must be directly related to the student's major field of study in the Graduate College and be approved as a part of the plan of study by the student's adviser and the major department. Work completed while registered for a professional degree in Law, Medicine or Dentistry will be counted as part of the residence requirement for nondoctoral degrees in the Graduate College only when the student is registered in an appropriate joint degree program.

G. Two Master's Degrees

The granting by this University of two master's degrees simultaneously or in succession requires the satisfaction of all requirements for each degree separately, including theses, where a thesis is required for each, and two examinations, with a minimum combined total of 60 semester hours of graduate credit.

H. Master's Degree with Thesis

Not more than eight semester hours of credit for thesis preparation shall be counted in satisfying the 30-hour minimum requirement. The thesis may be a scholarly study or an artistic production.

One copy of the thesis, in typed manuscript or print, must be presented to the Graduate College for a check of formal characteristics not later than four weeks before the graduation in which the degree is to be conferred. (See Graduate College publication, *Requirements for Graduate Theses*.) After approval by the Graduate College and by the thesis committee, a final copy of the thesis must be deposited with the Graduate College not later than 10 days before graduation.

The thesis committee shall consist of at least three members of the graduate faculty and may or may not be identical with the final examination committee. (See "K. Examining Committee.")

I. Master's Degree without Thesis

A master's degree without thesis, consisting of at least 30 semester hours of graduate study, may be awarded upon the completion of a curriculum prescribed by a department and approved by the Graduate Council.

J. Final Examination

The requirements for all master's degrees include a final examination, which, at the

discretion of the major department, may be written or oral or both. Such an examination will not duplicate course examinations. It will be evaluated by the examining committee as satisfactory or unsatisfactory with two unsatisfactory votes making the committee report unsatisfactory. The report of the final examination is due in the Graduate College not later than 48 hours after the date of the examination.

If the examining committee so recommends, a candidate who fails the examination may present himself or herself for reexamination, but not sooner than the following term (semester or summer session).

The examination may be repeated only once.

Upon recommendation of a department, the comprehensive examination for the Ph.D. degree may be substituted for the master's examination.

K. Examining Committee

The examining committee for the master's degree consists of at least three members of the graduate faculty, appointed by the graduate dean upon recommendation of the major department or program, at least two of whom are from the major department. If the examination covers work in another department, one member of the committee must be from that department. Upon recommendation of the major department, the dean may appoint additional qualified persons (not necessarily members of the graduate faculty) to serve as voting members of the examining committee, and, at his or her discretion, the graduate dean may add a member to the committee.

Section XI. Two-Year Degrees

A. Master of Fine Arts Degree

This degree is awarded for creative work in the visual arts, dramatic art, music and literature. It is designed for students preparing themselves professionally in such fields as painting, design, mural decoration, sculpture, playwriting, acting, producing, stage design, musical performance, composition, instrumentation, poetry, fiction and translation. Central to the program, the thesis may consist of a novel, a painting, a play, a musical composition or any other approved artistic accomplishment.

The program for the Master of Fine Arts requires at least two years of residence credit in a graduate college. This requires a minimum of 48 semester hours of graduate credit, at least 24 of which must qualify for residence credit at this University. A Master of Arts degree may be earned while the student is working toward the Master of Fine Arts degree, but the student must meet all requirements for each degree separately, with a minimum combined total of 60 semester hours of graduate credit.

For other requirements see "Section X.B. Plan of Study"; "C. Major and Related Fields"; "E. Reduction of Old Credits"; "H. Master's Degree with Thesis"; "J. Final Examination"; and "K. Examining Committee."

B. Specialist in Education Degree

This degree is granted upon completion of a prescribed two-year, postbaccalaureate program designed for students preparing themselves professionally in such fields as teaching, administration and supervision, and special services.

Of the minimum of 60 semester hours required for the degree, at least 24 semester hours must be completed in residence at this University of which 15 semester hours must be earned while the student is on campus within one 12-month period or during two summer sessions.

Twenty-eight of the 60 semester hours are prescribed in the area of specialization. The others are in cognate fields, supervised experience and electives. Four semester hours of research culminate in a written report.

Courses successfully completed ten or more years prior to the final examination will be evaluated by the major department in order to determine the amount of credit that shall be allowed for such work. Evaluation of such old credits will be reported to the Graduate College by the departmental executive at the time of submission of the plan of study.

Other requirements and regulations applicable to the educational specialist degree are the same as prescribed for the one-year master's degree in "Section X.B. Plan of Study"; "C. Major and Related Fields"; "F. Limit on Law, Medical or Dental Courses"; "J. Final Examination"; and "K. Examining Committee."

A master's degree may be earned while in residence for the educational specialist degree provided the student meets all the requirements for the master's degree in question.

C. Master of Social Work Degree

The M.S.W. degree is conferred by the University upon those students who give evidence of knowledge and competence in the professional practice of social work by meeting the following requirements:

1. A minimum of 24 semester hours in residence at The University of Iowa;

2. A minimum of 52 semester hours in graduate social work, including a research requirement; and

3. A final comprehensive examination, written or oral or both, covering all work for the degree.

The requirement of 52 semester hours may be interpreted to mean that a student who can satisfy the faculty of the School that he or she has accomplished, in the junior or senior undergraduate years, the clear equivalent of part or parts of the graduate curriculum in social work may be permitted, upon recommendation of the faculty of the School, to qualify for the M.S.W. degree on less than 52 semester hours. In no case may a student qualify for the degree on less than 40 credit hours in graduate social work study.

The curriculum is organized into four general areas: social work practice, human growth and behavior, the social services and research. During the two-year graduate program, classwork is combined with field practice in social agencies or social work departments. Since classwork and field practice are arranged sequentially, students can enter the School of Social Work only in August.

For other requirements, see "Section X.B. Plan of Study"; "E. Reduction of Old Credits"; "F. Limit on Law, Medical or Dental Courses"; and "K. Examining Committee."

Section XII. Doctor's Degrees

A. Character of Degree

The University awards two doctorates, the Doctor of Philosophy and the Doctor of Musical Arts. The doctorate is the highest degree awarded by the University. The Doctor of Philosophy degree indicates marked excellence in research or other creative work, and superior comprehension in the discipline. The Doctor of Musical Arts degree indicates marked excellence in performance and pedagogy.

B. Prerequisites

The candidate must present evidence of having completed a satisfactory amount of undergraduate work in the subject proposed for investigation or, in the case of deficiency, must register for prerequisite courses.

C. Residence Requirement

The doctorate is granted primarily on the basis of achievement rather than on the accumulation of semester hours of credit; however, the candidate is expected to have completed at least three years of residence in a graduate college. At least part of this residence must be spent in full-time involvement in one's discipline, at this University, beyond the first 24 semester hours of graduate work; this requirement can be met either by: (1) enrollment as a full-time student (nine semester hours minimum) in each of two semesters or (2) enrollment for a minimum of six semester hours in each of three semesters during which the student holds at least a one-third-time assistantship certified by the department as contributing to the student's doctoral program. (For purposes of record and assessment of fees, student registration should reflect accurately the amount and kind of work undertaken in the Graduate College. All doctoral programs, including acceptable transfer credit, will contain a minimum of 72 semester hours of graduate work.)

D. Plan of Study

The development of a plan of study at the doctoral level is the special responsibility of the student working together with his or her adviser. A formal plan of study must accompany the departmental request to the Graduate College for permission to conduct the comprehensive examination. The plan will provide a listing of all graduate courses taken which apply toward the degree and a listing of courses in progress or to be completed after the comprehensive examination.

E. Ad Hoc Interdisciplinary Programs

A student may prepare a proposal for an interdisciplinary course of study, including the plan for the comprehensive examination, under the sponsorship of at least three faculty members and the department most directly concerned, which shall be designated as the sponsoring department. Final approval of such individual programs is granted by the graduate dean, who may add members to the student's supervising committee from other closely related departmental faculties. The degree will be awarded in the interdisciplinary field stipulated in the approved program and, parenthetically, the name of the sponsoring department.

F. Reduction of Old Credits

Courses taken ten or more years prior to the comprehensive examination will be evaluated by the major department in order to determine the amount of credit that shall be allowed for such work. Evaluation of such old credits will be reported to the Graduate College by the departmental executive at the time of submission of the plan of study.

G. Limit on Professional Courses

Work taken by a student in the colleges of Dentistry, Law or Medicine while enrolled for a professional degree may be credited to a graduate program leading to a doctoral degree if it is taken after the student has satisfied the requirements for a bachelor's degree at this University. The work accepted from the professional colleges must be directly related to the student's major field of study in the Graduate College, and the plan of study must be approved by the student's adviser and the major department. Work completed while registered for a professional degree in law, medicine or dentistry will not be counted as part of the one academic year which must be spent in residence as a doctoral student on the campus of this University.

H. Joint Program for Master's and Doctoral Degrees

Those students who expect to continue their training through the doctoral degree may file a joint program for the master's and doctor's degrees. The master's examination may be combined with the comprehensive examination for the doctorate for these candidates. The examining committee will file separate reports of its actions on the final examination for the master's degree and for the comprehensive examination. Upon recommendation of the department and approval of the graduate dean, students who are well qualified by previous training may submit a plan of study that leads directly to the doctoral degree without earning the master's degree as an intervening part.

I. Requirement in Foreign Languages

There is no general Graduate College requirement in foreign languages. Those departments which do require competence in one or more foreign languages establish standards as to the extent and level of competence, as well as methods of testing. Specific requirements will be found in the departmental statements of standards and procedures (see "Section IV.D."). Departmental executive officers are responsible for reporting completion of requirements to the registrar for entering on the student's record.

Specifications of departmental requirements in foreign languages are filed in the Graduate College office and may be changed upon the initiative of the departments.

J. Comprehensive Examination

The candidate must pass a comprehensive examination, consisting of written or oral parts or both at the discretion of the major department. Admission to the comprehensive examination is granted upon the recommendation of the major department, the filing of the plan of study and the approval of the dean of the Graduate College. A student must be registered in the University at the time of the comprehensive examination, which must be passed not later than the session prior to the session of graduation. This examination, administered only on campus, is intended to be an inclusive evaluation of the candidate's mastery of the major and related fields of study, including the tools of research in which competence has been certified.

The comprehensive examination is not a deferred qualifying examination. It is intended to evaluate the candidate's mastery of his or her subject at or near the end of his or her formal preparation and prior to the completion of the dissertation. The comprehensive examination and the final examination, which is concerned chiefly with defense of the thesis and related subjects, are the two principal examinations for the doctoral degree.

The comprehensive examination will be evaluated by a convened meeting of the committee and reported as satisfactory, satisfactory with reservations or unsatisfactory to the Graduate College office within 14 days after the completion of the examination. Two "unsatisfactory" votes will make the committee report unsatisfactory. The report of a satisfactory examination should contain the name of the supervising professor for the candidate's dissertation.

In the event of a report with two or more votes of "satisfactory with reservations," the exact stipulations of the committee should be recorded in the report form. If the stipulations involve further examination in a

particular area of study, the statement should be specific in defining the area, in requiring additional courses or other procedures, and in specifying the time and method of satisfying the stipulation. The candidate will not be admitted to the final oral examination until such stipulations have been satisfied. The executive of the major department should promptly send a written report to the Graduate College giving date of removal of "reservations."

In case of a report of unsatisfactory in a comprehensive examination, the committee may grant the candidate permission to present himself or herself for reexamination not sooner than four months after the first examination. The examination may be repeated only once, at the option of the department.

K. Postcomprehensive Registration

The student is required to register each semester after passing the comprehensive examination until the degree is awarded. If a student fails to register, he or she may not be readmitted to candidacy until he or she has submitted an application which has been approved by his or her adviser, the departmental executive and the graduate dean.

All registrations should accurately reflect the amount and type of work undertaken, the use of University facilities and the amount of consultation with the faculty. The student should register for the courses, research and thesis necessary to complete the plan of study.

When the registrations required for the plan of study have been completed, the student may meet the continuing registration requirement by paying a special minimum fee (Ph.D. postcomprehensive registration) for any semester in which the department (i.e., department chair or director of graduate studies) and the student's adviser determine that the student is neither making significant use of the University facilities (except library privileges) nor partaking of consultation with the faculty. It is understood that no registration for a summer session is required when the student makes no use of University resources unless the student is taking a degree at the end of that session.

L. Dissertation for the Doctoral Degree

A copy of the dissertation must be presented at the Office of the Graduate College not later than four weeks before the graduation date at which the degree is to be conferred and two copies deposited there in final form 10 days before graduation.

Regulations regarding preparation of the dissertation copy shall be promulgated by the Dean of the Graduate College. Dissertations will be microfilmed and thus made available on a permanent basis. An abstract of the dissertation, not to exceed 600 words of text, is to be deposited with the dissertation. The abstract must be approved and signed by the dissertation adviser. The abstract is published in the journal of *Dissertation Abstracts*. One copy of the dissertation typescript is bound and indexed at the University Library.

If the dissertation is in some nonprint form (e.g., painting, statue, performance in music) the librarian in charge of theses will help the student and faculty adviser work out an appropriate method of preparing the accompanying manuscript, if such help is needed. Once the manuscript is accepted, it is treated the same as any other.

Written dissertations shall be made available to all members of the examining committee not later than two weeks before the date of the examination.

M. Dissertation Fee

A nonrefundable dissertation fee is charged each candidate to cover the cost of the above processing of the dissertation and abstract.

N. Final Examination

The work for the degree culminates in a final oral examination administered on campus. This examination should include: (1) a critical inquiry into the purposes, methods and results of the investigation—not a mere recapitulation of the procedures followed; (2) intensive questioning on areas of knowledge constituting the immediate context of the investigation.

The final examination may not be held until the next session after the student passes the comprehensive examination nor until the first check of the dissertation by the Graduate College; however, a student must take the final examination no later than five years after passing the comprehensive examination. Failure to meet this deadline will result in a reexamination of the student to determine his or her qualifications for taking the final examination. The procedures to be followed are the same as those for the comprehensive examination. (See "XII.J. Comprehensive Examination.")

Final examinations for the doctorate are open to the public. Members of the faculty of the Graduate College are especially invited to attend and, subject to the approval of the chair, to participate in the examination.

The report of this final examination is due in the Graduate College office not later than 48 hours after the date of the examination. The final examination will be evaluated as satisfactory or unsatisfactory. Two unsatisfactory votes will make the committee report unsatisfactory. In case of a report of unsatisfactory in the final examination, the candidate may not present himself or herself for reexamination until the next session. The examination may be repeated only once, at the option of the major department.

O. Examining Committees

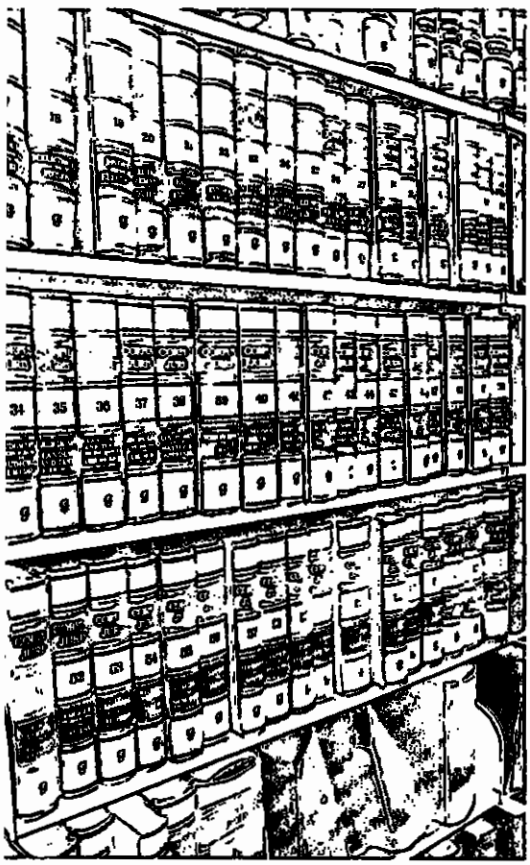
The comprehensive and final examinations are conducted by committees of no fewer than five members of the graduate faculty appointed by the graduate dean upon recommendation of the major department, except that departments may ask the dean for permission to replace one of the five members of the graduate faculty by a recognized scholar of professorial rank from another academic institution. A member of the graduate faculty from outside the major department is required in those cases where a related field outside the major department is included in the comprehensive examination. For the final examination one member of the committee must be a member of the graduate faculty from outside the major department.

Upon recommendation of the major department, the graduate dean may appoint additional qualified persons (not necessarily members of the Graduate faculty) to serve as voting members of the examining committees, and at his or her discretion the graduate dean may add a voting member to the committee.

Section XIII Exceptions

Petitions to waive these regulations may be made for appropriate and justifiable reasons on behalf of any graduate student through the departmental executive to the dean and the Graduate Council.

College of Law



Dean: N. William Hines
Dean emeritus: Mason Ladd
Associate dean: Mark E. Schantz
Assistant deans: Gregory H. Williams, Thomas C. Sennett
Faculty: *professors* David C. Baldus, Robert D. Bartels, David C. Bayne, Arthur E. Bonfield *(John F. Murray Professor)*, Willard L. Boyd, Helen A. Buckley, William G. Buss, Jr., Charles W. Davidson, Richard F. Dole, Jr., Dorsey D. Ellis, Jr., Samuel M. Fahr, N. William Hines, Jr. *(Law School Foundation Professor)*, Sheldon F. Kurtz, James E. Meeks, Paul N. Neuhauser, Charles A. Pulaski, Jr., Mark E. Schantz, George A. Stralt, David H. Vernon *(Law School Foundation Professor)*, Allan D. Vestal *(Carver Professor)*, Burns H. Weston, Alan I. Widiss
associate professors Hannah R. Arterian, Randall P. Bezanson, Steven J. Burton, Robert N. Clinton, Josephine Gittler, Robert A. Hillman, David Kader, Barry D. Matsumoto, Stephen L. Sass, George J. Wallace, Larry D. Ward
assistant professor Barbara Schwartz
instructors Anne Spitzer, John Thompson
lecturers Philip A. Leff, Casey D. Mahon, Darrel A. Morf, James Nemmers, William V. Phelan, L. Vern Robinson, Dr. Earl Rose
Degree offered: J.D.

The University of Iowa College of Law is one of 27 charter members of the Association of American Law Schools and has long been recognized and approved by the American Bar Association's Council of the Section of Legal Education and Admission to the Bar.

The Curriculum

Iowa's law program is distinctive in its first-year approach. There is a freshman seminar in which small groups of students have opportunities for more individual expression, closer faculty relationships, the writing of several research papers and a closer approach to graduate-level instruction.

Each first-year course has a specified function in helping students develop analytical abilities and placing the legal process in its social context. All first-year students are introduced to legal research through written assignments, as well as instruction in legal method and in legal bibliography.

During the second year, all students are required to take torts and a course in appellate advocacy. Before they graduate, all must also take a second course in constitutional law. All other second- and third-year courses are elective.

Each student will be required to complete five units of research and writing in addition to the first-year writing program. This requirement can be satisfied through any combination of courses and activities which carry writing credit, including seminar papers, independent research projects, *Iowa Law Review* and participation in the appellate advocacy and client counseling programs.

Students may also take courses in other colleges of the University. To receive credit for such a course, the student must obtain prior permission of the dean of Law.

Applicants to the College of Law should be advised that receiving a law degree does not alone qualify one for many professional positions. The supreme courts of each jurisdiction administer a bar examination, successful completion of which is a condition of practicing in their courts.

The Joint Program

In addition to its regular program leading to the Juris Doctor degree, the College offers a joint program leading to the J.D. degree and an advanced degree (M.A. or Ph.D.) from a participating department of the University of Iowa Graduate College.

Under this program, if a student takes a course which is relevant to both degrees, the course can be counted toward the semester-hour requirements for both degrees. In addition to reducing the time required to obtain both degrees, it is hoped the student will be able to contribute to one discipline the insights he or she has gained in the other.

Applicants for this program must meet admission requirements of the Graduate College, in addition to those of the College of Law.

Summer Session

Regular classwork of the summer session will extend over 11 or 12 weeks, with most courses taught in two successive periods of five and one-half weeks each. Six to eight upperclass courses and three to four first-year courses are normally offered. Students who begin their law study with a summer term may complete it in two regular and three summer terms, instead of the usual three calendar years. The work given in the summer is the same in kind and amount as that given in the corresponding subjects in the regular term, and the completion of any course in the summer gives the student full credit toward a degree.

Graduation Requirements

Residence Requirements

To satisfy the residence requirements, a student must complete a minimum of either:

(1) six semesters of not less than 12 semester hours each; or

(2) five semesters of not less than 12 semester hours each plus two summer sessions of not less than four semester hours each; or

(3) five semesters of not less than 12 semester hours each plus one summer session of not less than 12 semester hours;

(4) four semesters of not less than 12 semester hours each plus three summer sessions of not less than six semester hours each.

Scholastic Requirements

Numerical grades may be translated into letter grades for purposes of comparison as follows:

100-85=A, 84-80=B+, 79-75=B, 74-70=C+, 69-65=C, 64-60=D, 59-50=F

A first-year student who fails to maintain a cumulative average of 65 after registering for 24 or more semester hours of work shall be ineligible to continue in the College of Law. All other students must maintain a cumulative average of 65 to be eligible to continue in the College.

Graduation Honors

The J.D. degree may be granted with special honors as follows: With Highest Distinction—cumulative average of 85 or more; With High Distinction—cumulative average of 80-84; With Distinction—cumulative average of 75-79.

Related Activities

The Iowa Law Review

Published five times a year and circulated to more than 5,000 subscribers, the *Review* is managed and edited by College of Law students, who also write much of its material. Its editorial staff is selected from students showing exceptional ability in legal writing.

The Journal of Corporation Law

Published three times a year and circulated nationally, the *Journal* is managed and edited by College of Law students, who also write much of its material. The *Journal*'s editorial board is selected from students exhibiting superior writing skills.

The Iowa Advocate

Written, edited and published by law students, *The Iowa Advocate* provides a vehicle for College news, editorials, expressions of student opinion and profiles of College faculty members and guests.

Legal Clinic Program

Students who have completed one-half of the work toward their J.D. degrees are eligible to participate in the Legal Clinic Program, which offers four basic kinds of opportunities for students to apply their theoretical knowledge to real cases under the supervision of faculty members and other attorneys.

Students in the Legal Aid Clinic represent indigents in several eastern Iowa communities in a wide range of civil and criminal cases. Students in the Prisoner Assistance Clinic represent inmates at Iowa correctional institutions in both habeas corpus and civil cases. Both Legal Aid and Prisoner Assistance interns participate fully in interviewing, fact investigation, negotiation, and courtroom proceedings.

Students in the Clerkship Program act as law clerks to trial court judges. As such, they observe court proceedings and draft orders, opinions, and jury instructions.

Finally, students in the Legislative Internship Program are assigned to work as legal assistants to state legislators.

In addition to those programs carrying academic credit, the College of Law participates each summer in the County Attorney Internship Program, through which students work for pay for county attorneys throughout the state.

Appellate Advocacy

Provides each student experience in legal research, analysis, writing and oral argumentation. Includes competitions to determine which students shall represent the College of Law in the Regional and National Moot Court Competition, the Jessup International Moot Court Competition and the Wagner Labor Law Competition.

Client Counseling Program

Provides students an opportunity to develop interviewing and counseling skills through simulated client interviews. Includes an intramural phase and tournament competition to determine College of Law representatives to an American Bar Association-sponsored regional competition. Administered by a board of third-year students who have distinguished themselves in the program the previous year.

Center for World Order Studies

The Center for World Order Studies (a project of The Stanley Foundation of Muscatine, Iowa) was established in June 1972 at The University of Iowa as a Midwest center for education and research in the causes of and potential cures for existing and future world order problems, particularly those related to the use of military power across national boundaries. In cooperation with public and private schools, colleges and universities, and civic and business organizations throughout the country and especially in the Iowa-Illinois area, the major function of the Center is to promote increased understanding of these world order problems through curriculum innovation and revision, teacher training, conferences and workshops, simulation exercises, coffee seminars, publications, mass media activities, essay contests and debates, and other learning techniques.

Student Organizations

Law student organizations at Iowa include the Order of the Coif, a national honorary society whose membership is drawn from the top ten percent of the senior class; the Iowa Society of International Law; Phi Delta Phi and Phi Alpha Delta, national law fraternities; and the Black American Law Students Association, the Chicano Association for Legal Education, the Organization of Women Law Students and Staff, the Law Student Division of the American Bar Association, the National Lawyers Guild, the Environmental Law Society, and the Iowa Society of International Law. All students are members of the Iowa Student Bar Association, whose functions include placing students as voting members on faculty committees.

Facilities

The Law Building contains a library and air-conditioned classrooms. With its collection of approximately 300,000 bound volumes, the Law Library is an outstanding research facility. A broad open-stack policy makes it readily available to students.

Fees and Expenses

In addition to regular tuition and fees, books and supplies average about $300 per year. Housing costs and personal expenses will vary with individual circumstances.

Financial Aid

The College requires all students to enroll for a full schedule and discourages their taking outside employment during the first year. It has developed a comprehensive financial aid program which enables most students to meet expenses without outside employment. In addition to the awards listed in the "Scholarships and Loans" section of the *Catalog*, the College offers research assistantships with substantial stipends. Assistantships are awarded to high-ranking upperclass students who have demonstrated ability for research and scholarship.

Placement

A wide variety of placement opportunities is available upon graduation from the College of Law. These include opportunities to work in government, as clerks to judges, in corporations and in private practice. In recent years approximately half of the graduating class have assumed positions in Iowa. Each year numerous law firms, corporations and government agencies visit the University to recruit students from the College of Law.

Admission

Prelaw Studies

No prescribed program of undergraduate study is required for admission to the College of Law at Iowa. The student should pursue a program adapted to his or her own intellectual interests. However, the objectives of the program should include increased capacity for verbal comprehension and expression, increased understanding of human institutions and values, and increased facility of thought.

Admission Requirements

Students may enter the College of Law in the fall semester or summer term. Except for good cause shown, a prospective student must apply for admission by March 1 preceding the fall semester or summer session he or she wishes to enter.

The applicant must present a baccalaureate degree from an approved college or university before beginning work in the College of Law.

The College must have received, *by the deadline date*, the applicant's Law School Data Assembly Service report and Law School Admission Test results. The applicant is responsible for having all of his or her college transcripts sent to the Law School Data Assembly Service, located in Princeton, New Jersey. The Law School Admission Test is administered by the Educational Testing Service, also located in Princeton.

A $10 application fee must accompany applications from prospective students not completing their undergraduate study in residence at The University of Iowa.

Fulfillment of the specific requirements for admission listed above does not ensure admission to the College of Law. From applicants meeting the minimum requirements, the admissions committee of the College will select those who appear to be best qualified for the study and practice of law. The admissions committee may require personal interviews with applicants.

The College participates in the University's Educational Opportunities Program and gives individual consideration to applicants from disadvantaged backgrounds.

Advanced Standing

A transfer student may be eligible for admission if he or she has attended a school which is a member of the Association of American Law Schools, is in good standing at the time of withdrawal (evidenced by a letter from the dean of the school from which he or she is transferring), meets the admission requirements for entering students at this school and has done substantially above average work in the law school he or she attended. No more than 30 semester hours of resident credit may be transferred from another school. Where an applicant has completed more than one year of law, advanced standing will be permitted only in exceptional cases, and no more than one year's credit will be granted.

Advance Deposit

Accepted applicants are required to make a $50 deposit by April 1, or within two weeks after being notified of their acceptance, if that occurs after April 1. An applicant who fails to make the deposit within the specified time forfeits his/her place in the entering class. Those who enroll receive credit for the deposit on their first University bill. The deposit is refunded only to an applicant who cannot enroll because of circumstances beyond his/her control.

Physical Report

Accepted applicants who are new to The University of Iowa must submit a satisfactory physical examination report to the University Student Health Service.

Courses

91:104 Civil Procedure **2-5 s.h.**
After a brief overview of a lawsuit, the course deals primarily with pretrial procedures—subject-matter jurisdiction, jurisdiction over the person and venue, pleadings, motion practice, summary judgment and judgment on pleadings, joinder of parties and claims, pretrial discovery procedures; final portion of course deals with res judicata/vindication; designed to give student comprehensive, cohesive view of vindication of rights under modern practice.

91:116 Constitutional Law I **3-5 s.h.**
Allocation of governmental powers according to national constitution; judicial function in constitutional cases; relationships among several branches of national government; federal system; powers delegated to national government; powers reserved to states; role of judicial process in structuring limits within which society operates; institutional development of legal system and relationships among several institutions within system.

91:120 Contracts and Sales **3-6 s.h.**
Purpose, development, scope of judicial protection accorded parties to contractual agreements, as modified by legislation; creation of contracts, their performance, construction and interpretation, and remedies available upon breach, as well as the Sales Article of Uniform Commercial Code as article relates to unsecured sales transactions; role of law in ordering consensual arrangements; interrelation between judicial and legislative decisional processes.

91:124 Criminal Justice I **3 s.h.**
Objectives of criminal justice system; theories of punishment; general part of criminal law, act requirement,

state of mind requirements, principle of legality; grading of offenses in context of law of homicide; process by which guilt or innocence is determined and sanctions imposed, including limitations on police in identifying and apprehending suspects, the prosecution function in guilty pleas, and a survey of sentencing and corrections. Emphasis on "living law" as reflected in empirical research into actual functioning of the system.

91:125 Criminal Justice II **3 s.h.**
Description same as for 91:124.

91:126 Criminal Justice **arr.**
Description same as for 91:124.

91:130 Lawyers, Their Work and Their Responsibilities **2 s.h.**
Nature of various kinds of legal practices, including such things as allocation of and payment for legal services, potential conflicts of interests of legal practitioners, and regulation of the legal profession; the autonomy of client care; interaction of legal system in its many different institutions with other societal forces in the evolution of the law. Particular emphasis on nonlitigation aspects of the lawyer's work and responsibilities.

91:132 Property I **3-4 s.h.**
Concept of ownership as one of basic foundations of law; acquisition of property and limitations on its use and disposition, in conjunction with traditional common law methods and thinking; notions of possession and of public recording of ownership; asserted need for continuity and stability in property relationships; historical development of the law.

91:135 Resource Planning **3-5 s.h.**
Problems and processes associated with allocation and regulation of land, air and water resources, including zoning and other land use controls, rural land management programs, environmental quality controls, restrictions on use of depletable mineral and other resources, and methods of allocating use rights to resources not susceptible to ordinary forms of ownership; relationship between law and other disciplines; administrative aspects of resource planning presented; use of law to achieve affirmative social goals.

91:191 Energy in Contemporary Society **3 s.h.**
Same as 44:191, 12:114, 527:101.

91:202 Advanced Civil Procedure **2 s.h.**
One area of procedural law is taken each year and studied in substantial depth.

91:203 Administration of Estates and Trusts **3 s.h.**
Detailed analysis of fiduciary duties and responsibilities; federal income taxation, distinguished from estate taxation, of estates and trusts; state inheritance tax proceedings; each student required to prepare numerous documents relating to probate and final settlement of an estate, including preparation of an estate's income tax return. Prerequisites: 91:272 and 91:376.

91:204 Administrative Law **3 s.h.**
Formal and informal procedures, processes and functions of state and federal administrative agencies, including legislative, executive and judicial control of administrative action.

91:205 Advanced Commercial Law **3 s.h.**

91:206 Advanced Criminal Procedure **3-4 s.h.**
Iowa and federal court rules of criminal procedure receive primary attention, especially as they relate to discovery, preliminary hearings, joinder and severance of offenses and defendants, motions directed against indictments, pleas of guilty, motions during trial, sentencing proceedings, appellate practices; process examined from perspectives of both prosecutor and defense attorney.

91:207 Advanced Tax Problems **2-3 s.h.**
Designed to "fill the gaps" in coverage left by other tax courses in the curriculum and to provide a significant experience in tax research and drafting. Problem method of instruction is used and heavy reliance is placed on prior preparation and classroom discussion. A wide variety of topics is covered, such as partnership taxation, qualified and nonqualified deferred compensation plans, tax procedure, charitable contributions, exempt organizations, private foundations, cash and accrual methods of accounting, advanced capital gains and tax policy issues. Prerequisites: 91:272 and 91:243.

91:208 Antitrust Law **3 s.h.**
Legal and economic aspects of governmental regulation of business conduct and creation and enforcement of private rights under antitrust laws; Sherman, Clayton, Robinson-Patman and Federal Trade Commission Acts and related legislation; multifirm collaboration, monopolies, mergers, resale price maintenance, price discrimination and patents; governmental and private enforcement techniques.

91:210 Appellate Advocacy I **1 s.h.**
Instruction in and development of skills in appellate brief-writing and oral argument through participation in moot court competition. Must be taken in second year.

91:211 Appellate Advocacy II **1 s.h.**
Continuation of Appellate Advocacy I for second-year students who desire more experience in appellate advocacy. Prerequisite for those students who wish to enroll in Appellate Advocacy III and qualify for the Regional Moot Court Competition or Jessup International Moot Court Competition teams.

91:212 National Moot Court Competition **1 s.h.**
Intramural competition in appellate advocacy to qualify as Law School's representative in Regional Moot Court competition or the Jessup International Moot Court competition. Prerequisite: 91:211.

91:213 Jessup International Moot Court Competition **1 s.h.**
This course provides a unique opportunity for second- and third-year students to compete in intramural regional and national level moot court competition in the field of international law. It offers an opportunity to receive intensive constructive criticism in the art of appellate brief writing and oral argument. Prerequisite: 91:210.

91:214 Wagner Labor Law Competition **1 s.h.**
Intramural competition in the advocacy of labor law provides the student with an opportunity to deal with the specific problems of management and labor unions as raised on appeal. Teams showing outstanding ability in written and oral argumentation are selected to represent the school at national competition.

91:216 Business Planning **4 s.h.**
Problems involving common business transactions in context of business planning and counseling; emphasis on problems of closely-held corporations, including formation of corporations, allocation of stock and control, issuance of securities and capital structure, valuation, securities acts problems, dividends, reduction of capital and buying out of stockholders. Prerequisites: 91:241 and 91:272.

91:217 Corporate Reorganization **2 s.h.**
Thorough study of chapters X, XI of Federal Bankruptcy Act, which provides for court-supervised rehabilitation of businesses in bankruptcy; also provides necessary background in equity reorganization. Prerequisite: 91:241.

91:222 Commercial Transactions **4 s.h.**
Legal structure provided for commercial process of buying, selling, using, transporting and financing goods by Uniform Commercial Code, Bankruptcy Act and related law; consideration given to degree to which legal system efficiently handles problem of commercial exchange and to some of skills (transaction planning and drafting) involved in using Code.

91:224 Comparative Law **2-3 s.h.**
Comparative study of origins, development and characteristic features of world's main legal systems; emphasis on civil law and socialist law; some important problems of international judicial procedure; basic information on sources, ideologies and techniques of foreign legal systems; some subjects of particular importance in international legal practice, e.g., international judicial assistance, application of foreign law in American courts and application of American law in foreign courts.

91:228 Conflict of Laws **3 s.h.**
Problems created when transaction or relationship has associations with more than one jurisdiction; emphasis on selection of appropriate rules where differences exist in laws of various jurisdictions, and on recognition of judgments of other states; particular consideration to current evolution in theoretical approaches to these problems; particular limitations imposed on American state courts by federal constitution.

91:232 Constitutional Law II **3 s.h.**
Limits on governmental power imposed by national constitution for protection of individuals; due process of law and protection of life, liberty and property; freedom of expression and association; religious freedom and guarantee against establishment of religion; equal protection of laws. Required for graduation.

91:234 Consumer Problems **3 s.h.**
Legal controls on process of acquiring consumer goods, services or land; advertising control, disclosure devices, restrictions on contractual terms and credit collection practices; consumer aspects of bankruptcy; effective methods for reform. Can replace 91:244 for students concerned with consumer-related law. Prerequisite: 91:222.

91:235 Economic Analysis for Lawyers **1 s.h.**
Development of skills in certain fundamental techniques of economic analysis relevant to legal issues, including the economic theory of consumer behavior, theory of demand, nature of costs, theories of competition, monopoly and oligopoly, role of the market and resource allocation. Course meets three hours a week for the first five weeks of the semester; exam at the end of the five weeks. Recommended for 91:208, 91:336.

91:241 Corporations I **3 s.h.**
Structure and characteristics of modern business corporation, including both large publicly-held corporation and closely-held corporation; particular attention to distribution of powers among management, directors and shareholders, fiduciary duties which limit these powers, enforcement of such duties by shareholder suits.

91:242 Corporations II **2 s.h.**
Continues on more intensive basis work begun in 91:241, which is prerequisite.

91:243 Federal Income Tax II **3 s.h.**
Considers income tax treatment of corporations and shareholders with particular emphasis on the closely-held corporation and its shareholders; among subjects covered are organization of the corporation, capital structure, distributions (dividends and redemptions), liquidations, Subchapter S elections, the accumulated earnings tax, the personal holding company tax, and corporate reorganization (fusions and divisions). Problems considered are tailored to needs of persons preparing for general law practice as well as those planning a specialized practice in the fields of tax and corporate law. May be taken by persons taking or having taken Business Planning. Prerequisites: 91:272 and 91:241.

91:244 Creditors' and Debtors' Rights **3 s.h.**
Relationship between debtor and creditor; rights of priority among creditors; mechanics of judgments, execution, levy, sale, redemption, attachment, garnishment and exemp-

tions; transfers voidable by creditors; creditors' agreements; bankruptcy. May not be taken by students who have taken 91:234.

91:247 Criminal Law Problems **2 s.h.**
Explores selected problems in substantive criminal law not covered or discussed only generally in Criminal Justice. Examples of such problems include: mental illness and the criminal law; inchoate crime (solicitation, attempt, conspiracy); principles of justification (duress, defense of self, defense of property, law enforcement); and principles of accomplice liability.

91:250 Criminal Trial Practice **2 s.h.**
Series of drafting and courtroom exercises involving various legal, tactical and ethical problems which commonly confront prosecutors and defense attorneys in criminal cases; students serve as prosecutors or defense attorneys on several problems, for which they draft necessary pleadings and legal memoranda, prepare appropriate witnesses, and conduct pertinent trial proceedings. Prerequisite: 91:206.

91:254 Education Law **3 s.h.**
Law affecting governance of schools, including rights of students, parents and teachers concerning such matters as religion, racial discrimination, speech, association and privacy; liability of school districts; roles of local, state and federal government in financing schools and determining educational policy; interaction of law and educational policy.

91:255 Environmental Law **3 s.h.**
Builds on foundation laid in Resource Planning; emphasis on close study of water and air pollution laws and National Environmental Policy Act, their implementation and their interpretation by the courts; other areas of environmental law also covered.

91:260 Estate Planning Problems **2-3 s.h.**
Problems in creating and implementing plans for accumulation, conservation, and disposition of private estates; special attention to effecting accommodations between estate owners' objectives, property laws and taxation; extensive exercise in drafting and critically examining instruments, both testamentary and inter vivos; students must prepare for critical review one or more special projects, weekly critiques of others' projects, occasional individual research memoranda. Final Estate Plan roughly equivalent to seminar paper in time involvement. Open to third-year students only. Prerequisites: 91:360 and 91:378.

91:265 Evidence **3 s.h.**
Examines rules of evidence developed by common law courts and modern codifications; logical and legal relevance; the hearsay rule and its exceptions; the examination of witnesses; competence; privilege; expert testimony; judicial notice; burden of proof and presumptions; function of judge and jury.

91:268 Family Law **3 s.h.**
Creation and dissolution of marriage, with particular emphasis on validity of marriages; common law marriages; annulment; divorce; alimony; child custody and problems of support; attempts to combine lawyer's practical approach in dealing with family law problems with broader view of how law might treat family law problems in light of findings from social and behavioral sciences.

91:272 Federal Income Taxation **3 s.h.**
Federal income tax law as embodied in Internal Revenue Code and administrative and judicial interpretations thereof; emphasis on individual taxpayer, in business as well as personal context; analysis of tax and tax policy questions relating to income, deductions, income splitting, disposition of property and capital gains.

91:275 Federal Jurisdiction **3 s.h.**
Thorough consideration of federal court system and examination of original and removal jurisdiction of United States District Courts; problems posed by *Erie R. Co. v. Tompkins* and its progeny; relations between state and federal courts; venue in civil cases; appellate jurisdiction of Courts of Appeals and Supreme Court.

91:277 Fundamentals of Injury and Disease for Lawyers **2 s.h.**
Medical problems arising in contexts of workmen's compensation and personal injury litigation and of criminal prosecutions.

91:278 Future Interests **3 s.h.**
Common law scheme of estates and future interests in real and personal property, legal and equitable; construction problems; technical rules in historical perspective and under modern statutory law; perpetuities and powers of appointment; approaches to resolution of future-interest problems and to planning for avoidance of such problems.

91:284 Insurance **3-4 s.h.**
Principles of general application in insurance law, including doctrines relating to principle of indemnification, transfer of risk, scope of protection and problems arising out of differences in marketing arrangements; insurance as institution for allocation and distribution of risk; proposals for modifications in automobile liability insurance.

91:285 Introduction to International Law **3 s.h.**
Examines the past, present, and future role of law in promoting world public order among a broad spectrum of participants (nation-states, international government organizations, private associations, and individual human beings) who are engaged in a wide variety of pursuits across national and other territorial boundaries. Introduces the student to problems of authority and notions of jurisprudence in a legal system which usually operates in the absence of a "police force" as commonly understood.

91:288 Jurisprudence **2-3 s.h.**
Selected legal philosophers; particular attention to application of their jurisprudence to current legal problems.

91:290 Juvenile Justice **3 s.h.**
Defining delinquent behavior, various causal theories of delinquency, measurement and extent of delinquency; juvenile court system, its failure to achieve its aims, recent legislation and judicial attempts to reform it; alternative methods of delinquency control, such as family and schools; forms of judicial intervention other than delinquency proceedings.

91:292 Labor Law **3 s.h.**
Rights of employees to organize into unions; limits of concerted activities by employees; collective bargaining; rights of individual employee within collective unit and within labor organization; limits on employer and labor organization activity which would result in racial discrimination in employment; role of lawyer in dealing with interrelationship between policy, statute, judicial and administrative decision.

91:293 Discrimination in Employment **2 s.h.**
Students in 91:292 may enroll for this additional credit hour on race, sex discrimination in employment, alternative legal grounds for challenging discrimination, claimed justifications for discrimination.

91:304 Corporate Accounting **2 s.h.**
Principles of accounting as applied to contemporary legal problems; reasons for different methods of income determination and asset valuation for various corporate and legal purposes; inquiry into interrelationship between accounting profession and legal system to determine applicable accounting principles.

91:305 Law and Psychiatry **2 s.h.**
Considers the nature and significance of mental diseases and disorders in various legal contexts. Through medical lectures and clinical presentations, the interaction of law and psychiatry is explored from the medical standpoint; in classes at the College of Law, the relationship is further developed from the lawyer's point of view.

91:306 Legal History **2-3 s.h.**
Use of law and legal institutions for dealing with social, economic, political and religious problems in societies quite different from ours, but part of our tradition; impact of changes in society on law and legal institutions; introduction to some great lawyers, judges and legal writers in our history.

91:307 Legal Counseling and Interviewing **2 s.h.**
Introduces law students to problems of counseling and interviewing clients; most of the course is taught at the Psychiatric Hospital by staff members, including psychiatrists, psychiatric social workers and clinical psychologists.

91:308 Legal Profession **2 s.h.**
Public and private professional responsibility of lawyers; organization of profession and its economics, ethics and sociology.

91:309 Labor Arbitration **2 s.h.**
Explores labor arbitration as it relates to labor board procedures as well as the extent to which the arbitral forum is appropriate to the resolution of discrimination complaints. Traces judicial development of current concepts of arbitrability and review of awards, and studies the dynamics of the process: pleadings, burdens of proof, evidence and awards. Prerequisites: 91:292 and 91:320, or equivalent.

91:316 Litigation Pleading and Practice **2 s.h.**

91:318 Mass Communication Law **2 s.h.**
Study of selected issues relating to the role of the press in a free society; issues which may be analyzed include a brief survey of First Amendment theory as it relates to the press and communications media; defamation; privacy; free press and fair trial; reporter privilege; access to and use of governmental information; right of access to the press; and a study of regulation of radio and television broadcasting. Prerequisites: 91:232 and 91:364 or 91:365.

91:319 Native American Law **3 s.h.**
Native American Law will survey the specialized body of law which has grown up around Indian peoples.

91:320 Negotiation, Mediation, and Arbitration **3 s.h.**
Negotiation, mediation, and arbitration in various specific contexts. Readings are drawn from the writings of lawyers, psychologists, and sociologists. Students participate in a series of negotiations and arbitrations of problems based on actual cases. Classroom discussion will then focus specific problems the students have negotiated or arbitrated prior to class, with a view to relating these experiences both to the readings and to the types of situations students are likely to encounter in their professional careers. Thus, the problems will involve such areas as plea bargaining, personal injury claims settlement, disputes from the commercial sector, and labor law. It is anticipated that a psychologist or psychiatrist and practicing attorneys will participate in portions of the course, so that their special expertise can be brought to bear on the practical and psychological factors present in these processes.

91:323 Natural Resource Law **2 s.h.**
Survey of common law concerning renewable and nonrenewable natural resources, including wildlife, vegetation, water, oil and gas, and hard minerals; emphasis on evolving patterns of law in response to resource scarcity and social demands.

91:324 Patents and Intellectual Property **2 s.h.**
Protection of ideas under patent and copyright laws, common law of trade secrets; common law and statutory protection of trademarks, trade names.

91:327 Post-Conviction Rights and Remedies **3 s.h.**
After an introductory examination of the purposes of the correctional system, the course focuses on the rights of the prisoner in that system, and avenues of legal redress, including internal grievance procedures, habeas corpus, state postconviction relief, and civil rights actions.

91:328 Practice Court 2 s.h.
Preparation and trial of cases and actual demonstrations of trial practice problems. Prerequisite: 91:265.

91:330 Professional Liability 2 s.h.
Examines professional liability with a view to analyzing tort and contract theories of liability applied to accountants, architects, doctors and lawyers.

91:332 Property II 3 s.h.
Modern real estate transactions, including problems of landlord-tenant relationship, real estate brokers, tax consequences, land sale contracts, mortgages, insurance, conveyancing practices, title examinations, financing techniques and organization of real estate development ventures.

91:336 Regulated Industries 3 s.h.
Legal and economic aspects of direct regulation of business by administrative agencies; selected techniques of regulation, such as rate making, control of entry and control of quality and quantity of service; several different industries covered as illustrations. Prerequisite: 91:204 or 91:208.

91:340 Remedies 3 s.h.
Examines and compares the basic judicial remedies for redress of wrongs, unjust enrichment, and breach of contract. The course also considers the adequacy of the remedial process in relation to remedial goals. Remedies examined include injunction, specific performance, restitution.

91:348 Securities Regulations 3 s.h.
Federal, state regulation of sale of common stock and senior securities by corporations to public; federal law of corporations in areas of fraud, civil liabilities and management-shareholder relations evolving from various federal statutes administered by Securities and Exchange Commission. Prerequisite: 91:241.

91:350 Sex Discrimination Law 2 s.h.
Examines the rapidly growing variety of legal issues developing in this area, in the direct context of sex-based discrimination per se, and as such problems cut across basic diverse fields, such as constitutional, family, business, labor, criminal, property, and administrative law. Remedial as well as substantive elements will be emphasized. Prerequisite or corequisite: 91:232.

91:351 Scientific Evidence 2-3 s.h.
Examines legal, methodological and jurisprudential problems arising from use of scientific evidence as a basis for judicial and legislative decision making; emphasis on skills attorneys need to interpret and use scientific evidence and on procedures used to formulate and decide scientific issues; primary objective is to give lawyers without a scientific background the competence to identify scientific issues and to deal with experts and scientific evidence in a legal context. Each student will be assigned one writing project or more that will earn one writing unit as part of the three academic credits. A limited number of students will also be permitted to do longer writing projects for independent research credit.

91:352 Selected Real Estate Problems 2 s.h.
Real property title abstracts; problems associated with real estate development and transfer, including practice before planning and zoning commissions and financing of subdivisions and commercial developments.

91:353 Social Welfare 3 s.h.
Causes, extent of economic inequality and poverty in U.S., their impact on the poor and on society at large; government policies to reduce economic insecurity and inequitable distribution of income, employment opportunities, education, municipal services; analysis and use of social science research as tool of legal advocacy and as a vehicle for studying the impact of legal doctrine. Additional instruction offered for students without knowledge of statistics.

91:354 State and Local Government 3 s.h.
Legal status of and relationship between legislative, executive and judicial branches of state government and various types of local governments; state constitutions, their amendment and revision; constitutional conventions.

91:360 Taxation of Gratuitous Transfers 3 s.h.
Inquiries into effect upon all parties of existing levies on inter vivos and death property transfers; primary emphasis upon federal estate and gift tax, their state counterparts and income tax effects which flow from individual's death and distribution of his estate. Prerequisites: 91:272 and 91:378.

91:361 Theories of Social Control 3-4 s.h.
Explores the philosophical foundation of the criminal justice system and the correctional process and seeks to evaluate the effectiveness of and alternatives to our existing structure. Specific topics discussed include the appropriate role and scope of criminal law in a society, specifically focusing on the so-called victimless crime problem; and innovations and improvements in the correctional process, such as the halfway house, community-based correction supervisory committees, recent improvement in the probation and parole systems.

91:364 Torts A 3-4 s.h.
Investigates civil actions for wrongs done to another; emphasis on question whether fault should be sole basis for tort liability; problems of distribution of risk in society, as well as relationship of actual litigation practice to legal theory examined. Must be taken in second year.

91:365 Torts B 3 s.h.
See 91:364 above.

91:368 Trade Regulation 3 s.h.
Analysis of government regulation of business; primary emphasis on control of price discrimination under Robinson-Patman Act.

91:370 Trial Advocacy Pilot 2 s.h.
Limited-enrollment pilot program to train eight second-year students in the fundamentals of courtroom litigation. Corequisite: 91:265.

91:378 Trusts and Estates 3 s.h.
Survey of law of gratuitous transfers and decedents' estates, including fundamentals of estate and gift taxation; intestate succession, wills, trusts and future interests covered; primary emphasis on aspects of areas covered considered important to planning of family property arrangements.

91:400 *Law Review* 1-4 s.h.
Staff members and members of board of editors of the *Iowa Law Review* may earn up to four semester hours of credit for participation in work on *Review*.

91:402 Moot Court Board 1-2 s.h.
Moot Court Board members may earn one hour of credit for each semester of participation in the work of the board, which includes administration of the Appellate Advocacy program, research in connection with the appellate cases used in the program, judging appellate arguments; members selected on performance in Appellate Advocacy I and II.

91:403 Legislative Workshop arr.
Development of perspectives on the legislative process, development of legislative drafting and research skills. Limited to 10 students, selected in the fall from among the preregistrants.

91:405 Legal Aid Clinic arr.
Supervised work in Iowa City clinical offices; participation in a major project. Clinic I students also required to enroll in 91:408.

91:406 Prisoner Assistance Clinic arr.
Supervised work in offices within commuting distance of Iowa City; participation in a major project. Clinic II students also required to enroll in 91:408.

91:407 Clinical Semester arr.
Full semester at full-time clinical assignment, with regular reports to faculty supervisor, preparation of a paper on a topic related to work in clinical assignment. Students enrolling in Clinical Semester must also enroll in 91:408. Open only to students in fourth or fifth semester.

91:408 Legal Clinic Seminar 1-2 s.h.
Devoted to such topics as interviewing and counseling, negotiation, fact investigation, and litigation strategy. Open only to students enrolled in one of the other clinic courses.

91:410 Client Counseling I 1 s.h.
Offered in the fall. Intramural client counseling competition.

91:411 Client Counseling II 1 s.h.
Offered in the spring. Participation in the National Client Counseling Competition.

91:412 Client Counseling Supervision arr.
Student administration of Client Counseling Program.

91:415 *Journal of Corporation Law* arr.
Staff members and members of the board of editors of the *Journal of Corporation Law* may earn up to six semester hours of credit for their participation in the work of the *Journal*.

91:500 Independent Research Project arr.
Students may undertake independent research projects under the supervision of a faculty member for one or more semester hours of credit depending upon the scope of the project undertaken.

91:504 Tutorial 1-4 s.h.
May involve either substantive area of law or jurisprudential ideas as they appear in various intellectual spheres.

91:606 Selected Problems of Article 2 of the Uniform Commercial Code arr.
More intensive coverage of some aspects of the sales article of the Uniform Commercial Code touched upon in 91:120; examines some areas of Article 2 not covered at all.

91:608 Civil Law: Seminar arr.
Legal system which received Roman law; historical and functional analysis of French and German law of obligations (contracts and torts) and property; problems arising out of industrialization and technological progress. Prerequisite: 91:244 recommended.

91:610 Children in the Law Seminar arr.
The classroom component of the seminar will deal with neglected and dependent children and the juvenile court. Topics to be considered: child abuse reporting laws, application of void for vagueness doctrine to juvenile court neglect jurisdictional statutes, constitutional and statutory problems posed by juvenile court jurisdiction over emotionally neglected children, the right of parents to the assistance of counsel in neglect proceedings and the role of such counsel, the role of the guardian ad litem in neglect proceedings, the role of the social worker in neglect proceedings, dispositional powers of the juvenile court in neglect and dependency cases and the termination of parental rights, child protective services and other mechanisms for delivery of services to neglected and dependent children.

91:612 Civil Rights and Liberties: Seminar arr.
Selected problems in civil rights and liberties; particular areas scrutinized vary from year to year, but normally drawn from race relations, church and state; freedom of expression and association, right to vote and otherwise participate in political process; freedom from physical abuse; women's rights; students' rights. Prerequisite: 91:232.

91:620 Comparative Law Seminar arr.

91:626 Corporate Control Seminar arr.
Opportunity for advanced work in corporations through examination of newly emergent concept, corporate control.

Encompasses fiduciary obligation of persons at the absolute top of the policy-making hierarchy in the modern business corporation. Prerequisite: 91:241.

91:627 Criminal Trial Practice Seminar arr.
Limited to eight students. Students will be permitted, but not required, to write papers in conjunction with the seminars. Students wishing to do such writing will be given preference in admission to the course. Prerequisite: Advanced Criminal Procedure.

91:628 Consumer Problems arr.
Examines range of legal controls on the process of acquiring consumer goods, services or land. Such topics as advertising control, disclosure devices, restrictions on contractual terms, and credit collection practices will be examined. It is recommended that students have had Commercial Transactions or take it simultaneously.

91:629 Criminal Law arr.
Examines in depth problems in the criminal law area, taking a different problem each year.

91:632 Economic Regulation of Business arr.
Selected problems in the economic regulation of business; designed to build on foundation laid in the antitrust law and regulated industries courses.

91:633 Economics and Law arr.
Explores recent endeavors to extend economic analysis to legal problems beyond the traditional areas of antitrust and regulated industries; includes consideration of problems in such areas as property, contracts, criminal law, torts, and tax. Previous acquaintance with economics is not a prerequisite.

91:635 Free Speech arr.
Examines theoretical background for and judicial doctrinal development of the protection of freedom of expression; special attention to selected areas such as prior restraint, obscenity, libel, loyalty oaths, sedition, symbolic speech, protest in public areas or any other areas of interest to participants in the seminar. In addition to studying selected problem areas, seminar emphasizes development of overall theoretical understanding of free expression. Prerequisite: 91:232.

91:638 Education Law Seminar arr.

91:642 Environmental Law Seminar arr.
Examines a wide range of environmental problems, providing broader and deeper coverage than possible in Resource Planning; exact topics depend on late developments in the law and student interest.

91:643 International Economic Relations Seminar arr.
Ways in which the world community, through international agreements and/or processes, attempts to set ground rules for economic relations among states.

91:644 International Transactions arr.
Selected international and foreign law problems as they arise in the practice of law in the United States.

91:645 Problems in International Law and Policy arr.
Current problems of public international law and policy, such as control of the resources of the sea and control of international terrorism; students are encouraged to begin preparatory reading before commencement of the school year, and are required to complete a one-hour credit paper.

91:652 Land Use Planning: Seminar arr.
Problems arising in controlling use of land through zoning, public and private land arrangements, urban renewal, master plans, development of services and subdivision and development ordinances; mechanics of control through various governmental agencies, city, regional, state and federal; coordination of control efforts.

91:655 Legal History arr.
Examines major episodes which have had an important influence in shaping modern law; development of trial by jury; origins of common law, royal courts and the writ system; beginnings of Parliament; contract law and equity; and 17th-century contest for supremacy among the common law, Parliament, the King, and the other organs of government out of which many of our concepts of civil liberties arose. Attention directed not so much to substantive law applied at particular times as to processes of legal development, means employed, and limitations encountered in attempts to resolve critical issues.

91:656 American Legal History Seminar arr.

91:658 Partnership Planning arr.

91:660 The Police arr.
Examines the police from a number of different viewpoints. Specific topics covered will be history and development of police forces, varying and sometimes conflicting roles of police in both urban and rural areas, organization, management, and operations of police departments, police personnel including recruitment, training, and promotion of policemen, police culture, and police-community relation including relations between police and minority groups and juveniles. Particular attention to police accountability and methods of controlling police behavior both external and internal.

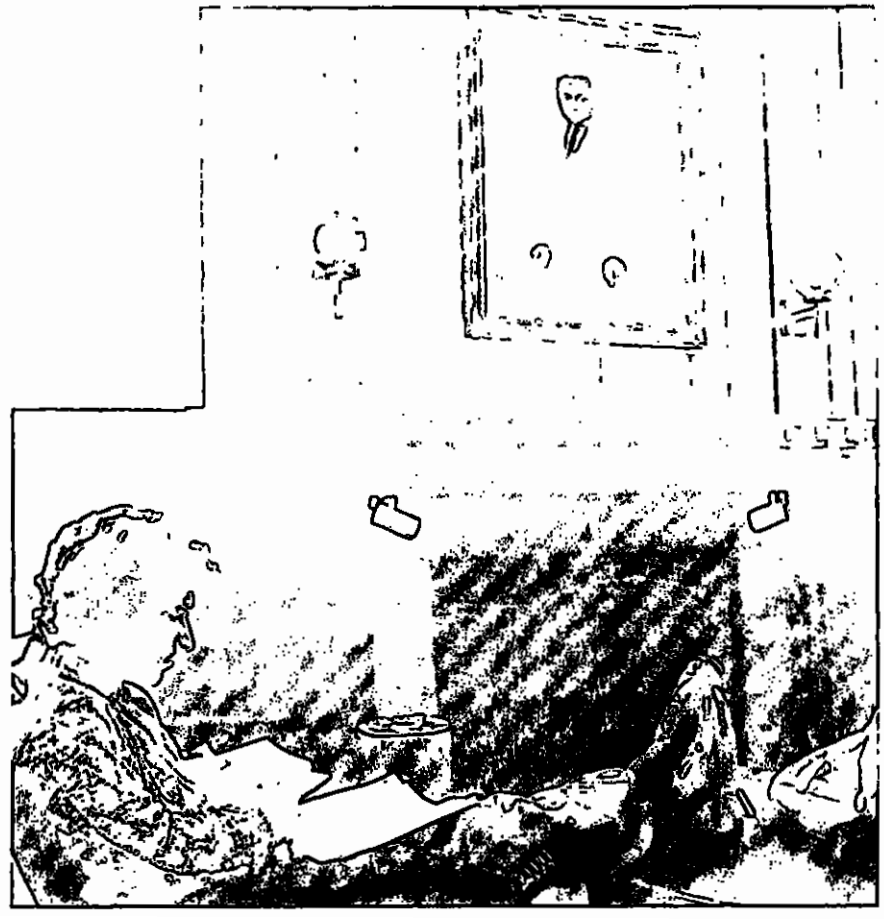
91:665 Problems in Public Law arr.
Selected problems in constitutional law and administrative law; sudent interest largely dictates specific topics selected. Prerequisite or corequisite: 91:232.

91:670 Public Employee Collective Bargaining arr.
In 1974 Iowa enacted the Public Employment Relations Act authorizing collective bargaining for public employees at all levels of government. This seminar will study intensively the statutory provisions and regulations and compare them with the comparable provisions of other public employment collective bargaining legislation, the executive order covering federal government employees, and the National Labor Relations Act. The seminar will place considerable emphasis on problems of administration and implementation. Students will be encouraged to choose as a paper topic some aspect of the general subject of public employee collective bargaining that includes both an important legal problem and an actual application of that problem in practice. Prerequisite or corequisite: 91:292 Labor Law or permission of the instructor.

91:679 Sex Roles in Law and Society Seminar arr.
Examines the rapidly growing variety of legal issues developing in this area, in the direct context of the sex-based discrimination per se, and as such problems cut across other basic fields. Prerequisite or corequisite: 91:232.

91:680 Native American Law Seminar arr.
Survey of specialized body of law which has grown up around Indian peoples; included are consideration of development of sovereignty arrangements over Indian peoples; civil, criminal and taxing jurisdictions on Indian reservations; special problems of property tenure and land use affecting Indian lands, Indian hunting and fishing rights; the history of federal Indian policy and its impact on modern Indian problems; tribal self-government; and federal Indian benefits and bureaucracies.

91:684 United States Supreme Court arr.
In-depth study; paper required. Prerequisites: 91:116, 91:232; 91:275 recommended.



College of Medicine

Dean: John W. Eckstein
Executive associate dean: Paul M. Seabohm
Associate dean, student affairs and curriculum: George L. Baker
Associate dean, academic affairs: Rex Montgomery
Associate dean, continuing medical education: Richard M. Caplan
Associate dean: Woodrow W. Morris
Assistant dean, Veterans Hospital affairs: Richard D. Eckhardt
Assistant dean, administration and finance: William L. Lillibridge
Assistant to the dean: Richard K. Schmidt
Degrees offered: B.S., M.D., M.S., Ph.D.

The University of Iowa College of Medicine accepts 175 freshman students each year into its four-year course of study leading to the degree, Doctor of Medicine. Its faculty members provide undergraduate and graduate instruction in anatomy, biochemistry, microbiology, pharmacology, physiology and biophysics, hospital and health administration, pathology, ophthalmology, otolaryngology, preventive medicine, environmental health, and radiation biology, to some 1,500 non-medical students each semester—most of them from the three other University of Iowa health profession colleges: Dentistry, Nursing, and Pharmacy, but many others from the life science areas of the College of Liberal Arts.

The College of Medicine is responsible for allied medical programs for the education of physician's assistants, medical technologists, physical therapists, and nuclear medicine technologists, and it carries on a year-around program of continuing medical education, in which several thousand practicing physicians update their knowledge and skills through "refreshers," short-courses, clinics, and conferences each year.

Beyond its academic responsibilities as the only college in Iowa offering work toward the M.D. degree, the College of Medicine is concerned with broad public issues of distribution and organization of health care services. Medical faculty members advise and serve as members of state and regional health planning councils, health boards, and various health agencies; some faculty also take part in the University's Health Services Research Center.

To provide opportunity for young physicians to experience the satisfactions of providing primary care in a community setting, undergraduate medical students have several opportunities to gain first-hand experience in physicians' offices and community hospitals. For medical graduates, a statewide system of family practice residency programs provides concentrated opportunity to learn this specialty in one or another of 16 community hospitals in eight cities throughout the state. The College of Medicine promotes and sponsors experimental programs that demonstrate methods of organizing health services at the local level.

Accredited by the American Medical Association and the Association of American Medical Colleges, the College of Medicine meets the requirements of all state licensing boards. Its diploma admits the holder to all privileges granted to graduates of all medical colleges before such boards. All other professional programs administered by the College of Medicine are accredited by their respective accrediting bodies.

The M.D. Program

The Doctor of Medicine program at Iowa differs in several significant ways from the traditional format of medical education. Its two-year introductory phase consists of three semesters of basic medical science and one semester of progressive orientation in clinical medicine. The third year consists of a summer session and two semesters of clinical clerkships, in which the student participates in patient care under supervision of staff physicians. The fourth year is devoted to an Intensive Study Program in which the student focuses on whatever fact of medical education best relates to his or her professional interests.

The Doctor of Medicine degree candidate's time of study must include attendance during at least four years of instruction. The candidate must have taken at least one year at The University of Iowa, must have attained a passing grade in each of the courses, and must have satisfied all other requirements of the College.

Medical Scientist Training Program

The Medical Scientist Training Program is an interdisciplinary program of the College of Medicine and the Graduate College designed to prepare individuals for careers in medical science and academic medicine with emphasis on research and teaching. With support from the National Institutes of Health, the Program provides an integration of the requirements for doctoral training in

sciences basic to medicine with the full clinical requirements of the medical curriculum. The Program entails six to seven years of study leading to the M.D. and Ph.D. degrees.

Combined M.D.-Master's Degree Programs

Students who want to pursue the M.D. degree in combination with an M.A. or M.S. program may do so by gaining admission both to the College of Medicine and to the Graduate College, and making detailed arrangements with the graduate department chair and the associate dean for Medical Student Affairs of the College of Medicine.

Graduate Programs

Programs leading to graduate degrees through the Doctor of Philosophy are offered in anatomy, biochemistry, microbiology, nutrition, pharmacology (including toxicology), physiology and biophysics, preventive medicine and environmental health science, and radiation biology. In addition, graduate degree programs leading to the Master of Science degree are offered in ophthalmology, otolaryngology, and pathology.

Faculty

All faculty members are full-time, their work in practice and research being part of—not apart from—their work in teaching. Many have earned national and international honors.

Facilities

Classes are taught in the Basic Sciences and Medical Laboratories buildings. A new Health Sciences Library is at the core of the medical campus.

Clinical Experience

Clinical experience is provided in the 1,181-bed University Hospitals and Clinics complex, in the adjacent Veterans Administration Hospital, and in a score of affiliated hospitals and ambulatory care centers throughout the state.

College of Medicine and College of Dentistry faculty members comprise the 315-member clinical staff for University Hospitals and Clinics, whose 16 clinical services are directed by heads of the corresponding academic departments in those colleges. These faculty members also provide instruction for the 470-plus resident physicians and dentists who comprise the House Staff of University Hospitals, which provide facilities for teaching all major medical specialties, for residencies in all such specialties, and for fellowships in a number of subspecialties.

University Hospitals and Clinics serve as a tertiary care center for the State of Iowa and portions of adjoining states, with most patients being referred for care and treatment not readily available in their home communities. Some 40,000 patients are admitted to the University Hospitals complex each year, while 51 specialty clinics serve another 300,000 ambulatory patients annually. More details concerning University Hospitals and Clinics, Veterans Administration Hospital, and other relevant academic and health service units may be found in "The University of Iowa Health Center" section of this *Catalog*.

Learning Resources Unit

The Learning Resources Unit of the College of Medicine is composed of educators and media specialists who serve the faculty, staff, and administration. The Unit has three major charges: to provide educational consultation, to initiate and cooperate in educational research endeavors, and to conduct teacher education activities.

Financial Aid

Loans are available to medical students on the basis of their need, and to the extent that loan funds are available. Most of these loans come from the United States Public Health Service's Health Professions Student Loan Program. Smaller and shorter-term loans are usually available through the Office of Student Services of the College of Medicine.

The College of Medicine awards approximately 100 tuition scholarships each year. Most scholarships are awarded on the basis of need, although, in accord with the donor's wishes, some are awarded on other criteria. These awards range in value from $500 to $1500.

Annual summer research fellowships with a stipend of $1000 are awarded on the recommendation of the sponsoring faculty members.

Educational Opportunities Program

The Educational Opportunities Program provides financial and academic assistance to educationally disadvantaged students from groups underrepresented in American medicine.

Admission to the M.D. Program

The College of Medicine participates in the American Medical College Application Service (AMCAS), a nonprofit centralized application processing service for applicants to U.S. medical schools. Preliminary applications are processed by AMCAS beginning July 1 of the year preceding the beginning of the class for which application is being made. Prospective students are urged to apply as early as possible. The closing date is December 1.

Final applications will be forwarded to those persons whose AMCAS applications pass a review conducted by the College of Medicine. The fee of $10 must accompany the final application from those who have not completed work in residence at The University of Iowa. This fee is not refundable except to residents of Iowa who are denied admission. Each applicant must also file with the Office of Admissions an official transcript from each college he or she has attended.

An applicant for admission to the College of Medicine must have:

Received the baccalaureate degree; or

Completed three years of a curriculum qualifying him or her to receive the baccalaureate degree after completing the first year in medicine; or

Completed three years of a baccalaureate program meeting the general graduation requirements of the college he or she is attending.

Prospective students must have earned at least 94 semester hours of credit, or the equivalent, including the following:

Physics: a complete introductory course.

Mathematics: college algebra and trigonometry, or advanced college mathematics for applicants who completed college algebra and trigonometry in high school.

Chemistry: as a minimum, a complete introductory course in organic chemistry,

ordinarily following a complete introductory course in modern general chemical principles.

Biological Sciences: a complete introductory course in the principles of animal biology, or zoology and botany (not botany alone), and an advanced biology course.

All the foregoing must be taken with appropriate laboratories.

Fulfillment of the specific requirements for admission does not ensure admission to the College of Medicine. From the applicants meeting the requirements, the admissions committee of the College of Medicine will select those who appear to be best qualified for the study and practice of medicine.

Applicants who have completed the baccalaureate degree and required courses five or more years before seeking admission to the College of Medicine will be considered by the admissions committee only under exceptional conditions.

To be considered for admission, an applicant must have attained a grade-point average of at least 2.5 (A=4) for all college work undertaken. Because the quality of work in premedical science is basic to success in medicine, special attention will be given by the admissions committee to grades in science and to the level of difficulty of the program undertaken. Where the college offers an option to take courses on a graded or pass-fail basis, it is expected that applicants will take the required science courses on a graded basis.

Preference will be given to applicants with high scholastic standing who are residents of Iowa, but consideration will also be given to outstanding nonresidents *exclusively under the Early Decision Plan.* Under this plan a single early application is submitted to one's first choice school by August 15 and the decision is made by October 1. Applicants are required to take the New Medical College Admission Test administered by the Association of American Medical Colleges in May or October of the year preceding that for which they are seeking admission. Students may make arrangements to apply for this examination through the University's Evaluation and Examination Services.

Personal interviews will be arranged as desired by the admissions committee.

Applicants accepted on or prior to February 15 must submit $50 advance payment by March 1. Applicants accepted after February 15 must submit this payment within two weeks after they receive notification of acceptance. The advance payment is credited toward tuition and fees.

All students entering the College of Medicine are required to submit the results of a physical examination. They must also take a tuberculosis skin test and, if it is positive, follow it by a chest X ray. Both the examination and the skin test should be completed during the year prior to enrollment.

Admission to Advanced Standing

A transfer student may be eligible for advanced standing if he or she meets the admissions requirements; has satisfactorily completed courses qualifying him or her for advanced standing; has achieved high scholastic standing; and submits a statement from the dean of the school from which he or she is transferring, showing work done at that school.

Unclassified Students

Applicants for admission to the College of Medicine who are not degree candidates but want to register for special subjects will be admitted to any lecture or laboratory course only upon complying with all the regular requirements for admission to such a course, or by action of the faculty upon recommendation of the professor in charge of the course.

Academic Advancement

The promotions committee appointed by the dean and consisting of designated members of the faculty under whom the courses have been taken will, at the close of the academic year, review the accomplishments of the students and determine their eligibility for advancement. In making its decisions the committee will consider the attainment of the student as evidenced by the grade received in each subject (which should reflect the consensus of the departmental staff), his or her seriousness of purpose, his or her conduct, and general fitness for entering the medical profession.

Admission to Associated Medical Programs

Admissions to the professional program in Physical Therapy and the baccalaureate degree program for Physician's Assistants, Medical Technologists and Nuclear Medical Technologists follow the selection described in their respective sections of this catalog.

Nondepartmental Courses

50:1 Medicine Elective Fourth Year arr.

50:2 Medicine Clinical Third Year arr.

50:3 Nutrition 2 s.h.

50:12 Preceptorship 2 s.h.

50:105 Law and Medicine for Physician's Assistant Students 1 s.h.
Acquaints the physician's assistant with fundamental principles of law bearing on professional activities; provides a basic vocabulary necessary to understand legal concepts.

50:110 Neurobiology and Behavior arr.
Interdisciplinary study of elements, organization, and functions of central nervous system. Same as 60:110, 72:110.

50:111 Introduction to Clinical Medicine 20 s.h.
Full-semester course devoted to correlating and integrating basic science core of information with clinical experiences of junior and senior years; included are pertinent information and development of skills in history-taking, physical diagnosis, laboratory diagnosis, and related material which will prepare student for required clinical clerkships.

50:112 Interdisciplinary Elective in Oncology arr.

50:118 Endocrinology for Medical Students 2 s.h.
Same as 60:118, 72:118.

50:121 Introduction to Clinical Medicine for Physician's Assistant Students 20 s.h.

50:161 Designing Learning Programs for Health Science Education 3 s.h.
Emphasis placed on development and evaluation of educational programs; suggested planning procedures and typical curricula analyzed and practical application gained through establishment of working relationship with ongoing educational program; activities individualized to meet various backgrounds, needs and objectives. Same as 7H:161, 7W:121.

50:175 Human Genetics 2 s.h.

50:198 Advanced Biomedical Studies 2 s.h.

50:199 Advanced Biomedical Studies 2 s.h.

50:201 Nutrition Seminar 1 s.h.
Presentations of current research findings in nutrition, therapeutic, and administrative dietetics.

50:202 Nutrition Seminar 1 s.h.

50:203 Clinical Nutrition 2-4 s.h.
Nutritional aspects of disease and illness, emphasizing therapeutic use of food; presented by medical and allied staff; lectures, demonstrations, bedside rounds, discussions, and student participation.

50:204 Clinical Nutrition 2-4 s.h.
Continuation of 50:203, but may be taken as an independent unit.

50:205 Projects in Nutrition arr.
Administrative, therapeutic, epidemiologic, food science, metabolic studies; introduction to research.

50:206 Projects in Nutrition arr.

50:207 Nutrition Research arr.
Research projects in administration, nutrition therapy, epidemiology, food science, metabolism.

50:208 Nutrition Research arr.

50:209 Hospital Dietary Administration 2-4 s.h.
Lectures and discussion of administrative techniques and methods for management, menu planning, purchasing, cost control, data processing, and food systems.

50:210 Hospital Dietary Administration 2-4 s.h.
Continuation of 50:209, but may be taken as an independent unit.

50:215 Comparative Nutrition 2 s.h.
Metabolic patterns in various species.

50:216 Analysis of Food Service Systems 2 s.h.
Review and evaluation of methods and equipment of various food service operations.

50:262 Facilitating Learning in Health Science Education 3 s.h.
Role of health careers educator as leader and learning facilitator explored in detail; student experiences wide variety of learning strategies through readings, discussion, observation, micro-experiences, and actual classroom activities. Prerequisite: 50:181 or equivalent. Same as 7H:262, 7W:262.

50:263 Topical Seminar in Instructional Design and Technology arr.
Special topics of interest to Health Sciences Education are studied as they relate to the health care delivery/education system. Topics vary according to the semester and the variety of health specialists represented in the class enrollment. Same as 7W:387.

50:273 Health Careers Education and the Health Service Industry 3 s.h.
Comprehensive overview of health service industry, particularly as related to both initial preparation and continuing education of health career personnel.

50:998 Special Study on Campus arr.

Anatomy

Department head: T.H. Williams
Faculty: *professors* Adrian E. Flatt, Nicholas S. Halmi, M.Z.M. Ibrahim, Ulf L. Karlsson, William W. Kaelber, Terence H. Williams
professor emeritus W.R. Ingram
associate professors Ramesh C. Bhalla, Paul M. Heidger, Jr., Frank Longo, Jerry Maynard, David J. Moffatt, Robert J. Tomanek, Gary Van Hoesen
assistant professors Asa C. Black, Jr., Jean Y. Jew, William J. Larsen, John A. Oaks, James C. Searls, James R. West
Degrees offered: M.S., Ph.D.

The Department performs three major functions: teaching anatomy of the human body to students preparing for careers in the health care professions; providing advanced courses, teaching experience and research training to graduate students preparing for careers in teaching and research; and conducting original research into biological structure and structure-function relationships. Each of these three functions complements the other two.

Instructing Students of the Health Care Professions

The Department contributes to the preclinical education of health care professionals by providing courses in gross anatomy, microscopic anatomy and neuroanatomy for medical and dental students; gross anatomy and neuroanatomy for physical therapy students; general anatomy and microanatomy for dental hygiene students; general anatomy for Physician's Assistants, nursing and pharmacy students. In most of these courses, the students learn about the structure of the human body mainly by working in teaching laboratories—dissecting, examining specimens with a microscope and studying specially developed learning materials. Innovative approaches to the study of anatomy, such as the use of programmed texts, videotapes and projection slide programs, have been developed by the faculty.

Graduate Study

The main goal of the graduate program is to prepare students for careers in teaching and research. Job opportunities, primarily in medical colleges, are excellent for anatomy Ph.D.s. Consequently, the graduate program emphasizes the training of Ph.D.s. The M.S. degree is offered only to students in health science programs who take time from their preclinical studies to acquire experience in teaching and research.

The M.S. is awarded on the basis of satisfactory completion of coursework in each of the major subdisciplines of anatomy—gross anatomy, microscopic anatomy and neurobiology; teaching experience in two of these areas; a thesis based upon an experimental study; and a successful oral defense of the thesis.

All students in the Ph.D. program acquire in-depth knowledge of gross, microscopic and neuroanatomy by taking courses and teaching in each of them. Since most students who complete the Ph.D. program will find positions in which teaching constitutes a significant part of the responsibility, the Department gives this special consideration. During the first year in the program, a student chooses a research area and becomes affiliated with a faculty member whose research is in that area. Research strength is currently found in endocrinology and reproduction, neurobiology, and cell and molecular biology. Early in the third year, the student takes a comprehensive examination assessing his or her ability to analyze, organize and apply the information, concepts and skills acquired in the first two years of the program.

The final examination for a Ph.D. candidate is a critical evaluation of his or her research capability. It consists of a written thesis and an oral thesis defense. The thesis is based on original experimental study done with the guidance of the faculty adviser and four other faculty members.

Admission

Admission to the graduate program follows general Graduate College requirements. Admission to the summer session is strongly encouraged. (See *Graduate College.*)

An applicant's undergraduate background should include advanced mathematics, one year of organic chemistry, at least two biology courses and one year of general physics. Applicants are considered for admission on a competitive basis, taking into account each applicant's record, performance on the Graduate Record Examination Aptitude and Advanced Tests, letters of recommendation and expressed career goals. It is highly desirable that applicants take the GRE Advanced Test in biology.

Financial Support

Financial support is available to some students selected for the Ph.D. program. To be considered for financial aid, applications should be completed by February 15.

Facilities

The Department occupies new quarters (over 35,000 square feet) in the Basic Medical Sciences Building on the Health Sciences campus. These quarters house modern facilities and well-equipped research laboratories. The most modern instrumentation is available, including four high-resolution electron microscopes, Balzar evaporation unit, spectrophotometer, cryostats, an automated gamma counting system, etc. Research is increasingly

problem-oriented, rather than discipline-dependent, and is principally in the theme areas mentioned in the previous section.

Courses

60:1 Elementary Human Anatomy 4 s.h.
Lectures and laboratory demonstrations on human anatomy. Primarily for students of nursing and dental hygiene.

60:2 Human Microscopic Anatomy 3-4 s.h.
Microscopic study of cells, primary tissues and organs; emphasis on tooth and related structure, including embryology. Registration limited to dental hygiene students. Fall.

60:101 Human Gross Anatomy for Dental Students 6 s.h.
Regional dissection, lectures and demonstrations with major emphasis on head and neck; includes neuroanatomy. Open to graduate students with consent of instructor. Spring.

60:102 Principles of Human Anatomy 3 s.h.
Lectures on gross and microscopic anatomy, with particular emphasis on organs involved in drug response and metabolism. Primarily for pharmacy students.

60:103 Gross Human Anatomy for Medical Students 8 s.h.
Regional dissection, programmed learning, lectures, demonstrations, tutorials and discussions. Includes embryology. Registration limited to medical students; graduate students referred to 60:203. Fall.

60:105 Microscopic Anatomy for Medical Students 4 s.h.
Microscopic study of cells, fundamental tissues and organ systems. Registration limited to medical students; graduate students referred to 60:205. Fall.

60:108 Human Anatomy 4 s.h.
Regional dissection, lectures and demonstrations with emphasis on areas important to physical therapists. Registration limited to physical therapy students, or others with consent of instructor. Fall.

60:109 Human Anatomy and Neuroanatomy 2, 4 s.h.
Dissection of head and neck; laboratory and lectures emphasizing elements, organization and functions of central nervous system. Open to graduate students with consent of instructor. Continuation of 60:108, which is prerequisite. Spring.

60:110 Neurobiology and Behavior arr.
Emphasis on the application of fundamental knowledge of the structure and function of the nervous system; interdisciplinary approach. Required of graduate students in anatomy, and sophomore medical students; open to others with consent of instructor. Fall. Same as 50:110, 72:110.

60:111 Gross Human Anatomy for Physician's Assistant Students 6 s.h.
Regional dissection, lectures and demonstrations with emphasis on adaptation of anatomy to physical diagnosis. Summer session. Prerequisite: enrollment in Physician's Assistant Program or consent of instructor.

60:112 General Microscopic Anatomy for Dental Students 4 s.h.
Cells, primary tissues and organs. Open to graduate students with consent of instructor. Fall.

60:114 Oral Microscopic Anatomy and Embryology 2 s.h.
Concurrent with 60:112; emphasis on tooth and related structures. Open to graduate students with consent of instructor. Fall.

60:118 Endocrinology for Medical Students 2 s.h.
Core course in endocrinology. Open to graduate students with consent of instructor. First eight weeks of spring semester. Same as 50:118, 72:118.

60:122 Independent Study in Anatomy arr.
Projects related to anatomy arranged with faculty member in Department. Primarily for undergraduate students. Any term. Prerequisite: consent of instructor and Department head.

60:201 Advanced Human Anatomy arr.
Specialized aspects of gross, microscopic, or neuroanatomy. Teaching, dissection and concentrated study are suitable aspects. Prerequisite: consent of Department head and course director.

60:202 Anatomy Research arr.
Open to anatomy graduate students with suitable backgrounds; by arrangement with faculty member.

60:203 Gross Human Anatomy for Graduate Students 8 s.h.
Regional dissection, programmed learning, lectures, demonstrations, tutorials, discussions, seminars. Includes embryology. Required of graduate students in anatomy; open to others with consent of instructor. Fall.

60:204 Teaching Workshop in Anatomy 2-4 s.h.
Practical application of educational psychology and learning theory to the teaching of anatomy; includes formulation of objectives, teaching methodology, learning resources, test construction and evaluation. May include a project. Fall. Prerequisite: consent of instructor.

60:205 Microscopic Anatomy for Graduate Students 5 s.h.
Comprehensive study of cells, tissues and organs at the light and electron microscopic levels. Required of graduate students in anatomy; open to others with consent of instructor. Fall.

60:206 Problems arr.
Projects related to anatomy arranged with a faculty member in the Department.

60:210 Introduction to Research 2 s.h.
Lectures and demonstrations on basic principles of research methodologies. Topics include separation techniques, experimental design, use of radioisotopes, autoradiography, immunocytochemistry, tissue culture, histochemistry. Spring.

60:211 Diencephalon: Neuroanatomy 1 s.h.
Relationship of thalamus and subthalamus to the anatomical and physiological aspects of the experimental and clinical aspects of pain. Spring, even years. Prerequisite: consent of instructor.

60:212 Neuroplasticity 1 s.h.
Morphological plasticity following injury in the adult mammalian central nervous system; emphasis on possible mechanisms underlying regeneration and collateral sprouting. Spring, odd years. Prerequisite: consent of instructor.

60:213 The Structure and Behavior of Membranes 1 s.h.
Recent models of membrane structures, structure and behavior of specialized membrane differentiations, including junctional complexes, membrane receptors, secretory structures; emphasis on functional implications of dynamic membrane behavior. Spring, even years. Prerequisite: consent of instructor.

60:214 Seminar in Muscle Biology 1 s.h.
Presentations by faculty and students. Topics include structure-function relationships in smooth, skeletal, cardiac muscle. Spring, even years. Prerequisite: consent of instructor.

60:215 Electron Microscopy of Gametogenesis and Early Development 1 s.h.
Selected topics concerning the cytophysiology of gametes, zygotes, and gonads, considered through lectures, seminar presentations, laboratory demonstrations; emphasis on electron microscopic correlates of cellular functions. Spring, odd years. Prerequisite: consent of instructor.

60:218 Introduction to Electron Optical Research Techniques arr.
Provides theoretical and practical knowledge for execution of biological transmission electron microscopy with introduction to scanning electron microscopy, electron probe analysis. Fall. Prerequisite: consent of instructor. Same as 2:218, 37:218, 61:218, 99:218.

60:220 Advanced Electron Optical Research Technique arr.
Provides theoretical and practical knowledge for execution of specialized techniques in transmission electron microscopy, scanning electron microscopy, electron probe analysis. Spring. Prerequisite: consent of instructor. Same as 2:220, 61:220, 90:220.

60:225 Anatomy Seminar 0 s.h.
Seminars in biostructure, emphasizing current research by faculty, advanced students, guest scientists. Registration optional.

60:232 Advanced Gross Anatomy arr.
Participation in instruction of freshman medical students in gross human anatomy. Prosections, attendance in discussions and lectures. Registration is limited to senior medical students. Fall. Prerequisites: consent of director of 60:103 and head of Department.

60:265 Neurobehavioral Sciences Seminar 0-1 s.h.
Open student-faculty discussion of current literature in research areas bearing on neurosciences and behavior. Prerequisite: consent of instructor. Same as 37:265, 72:265.

60:272 Seminar in Cellular and Molecular Biology 1 s.h.
Presentations by resident and visiting scientists, student presentations, discussions of current literature in cell biology. May be repeated for credit. Prerequisite: consent of instructor. Same as 37:272, 61:272, 71:272, 72:272, 99:272.

60:274 Scanning Electron Microscopy 2 s.h.
Lecture, laboratory and demonstrations of current topics and techniques in scanning electron microscopy. Prerequisite: consent of instructor. Same as 2:156, 12:156, 37:156.

60:284 Advanced Techniques in the Neurosciences 1 s.h.
Same as 37:284, 31:284, 71:284, 72:284, 99:284.

60:998 Special Study on Campus arr.
Registration limited to senior medical students.

60:999 Special Studies arr.
Registration limited to senior medical students.

Anesthesia

Department head: Wendell C. Stevens
Faculty: *professors* R. Dennis Bastron, Samir Gergis, Mohamed Ghoneim, Jack Moyers, Shiro Shimosato, Martin Sokoll, Wendell C. Stevens
associate professor Roland Kennedy
assistant professors James G. Carter, Sanford J. Klein
associates Victoria Gerhart, Josef A. Granwehr, Makiko Takashita

The Department introduces the second-year medical student to anesthesia as a specialty; helps to develop in the third-year student some concepts and technical skills related to resuscitation, airway management and the care of the comatose patient; and offers the fourth-year student more intense study in any and all phases of the Department. Wide clinical experiences, well-designed seminars and teaching conferences, and ongoing research activities develop in the post-graduate student, or resident, the intellectual depth and skills required of a specialist in anesthesia.

Courses

116:6 Clinical Anesthesia **2 s.h.**
Required for junior medical students. Clinical patient care in the operating room and recovery rooms. Includes seminars, clinical case conferences, and small group discussion sessions.

116:10 Clinical Anesthesia Senior **arr.**
Instruction and practical experience in various forms of anesthesia for surgical procedures; basic techniques of general, spinal, epidermal and peripheral nerve-block anesthesia; instruction in endotracheal intubation and other airway maintenance skills, management of comatose patient and cardiopulmonary resuscitation; pharmacology of anesthetics, both general and regional; their impact on respiratory and cardiovascular function, and various methods of treatment; course includes clinical anesthesia seminar, basic science seminar and morbidity and mortality conference.

116:11 Intensive Care **arr.**
Evaluation and treatment of seriously ill patients in Intensive Care Unit; artificial ventilation, evaluation of pulmonary function and monitoring of cardiovascular status; particular emphasis on postcardiac surgery patients and those needing prolonged ventilatory assistance; fluid balance and acid-base problems emphasized. Prerequisite: four hours 116:10.

116:12 Clinical Anesthesia Seminar **0 s.h.**

116:13 Basic Science Seminar **0 s.h.**

116:14 Morbidity and Mortality Conference **0 s.h.**

116:998 Special Studies on Campus **arr.**
Research in a well-defined project relating to anesthesia; areas of study available include effects of agents and situations which alter renal function; drug effects on neuromuscular conduction and action; potential generation utilizing microelectrode techniques; effects of anesthetics on cortical electrical activity of the human; obstetrical anesthesia. Individually arranged by student with approval of Department head. Open only to medical students. Prerequisite: 116:10.

116:999 Special Study Off Campus **arr.**

Biochemistry

Department head: Edward C. Heath
Faculty: *professors* Raymond L. Blakeley, Roger Chalkley, Thomas W. Conway, Robert L. Dryer, Daryl K. Granner, Edward C. Heath, George Kalnitsky, Rex Montgomery, Vittorio A. Pedrini, Arthur A. Spector, Lewis D. Stegink, Earle Stellwagen, Charles A. Swenson, Carl S. Vestling *professors emeriti* Clarence P. Berg, Joseph I. Routh *research professor emeritus* Henry B. Bull *associate professors* Arthur Arnone, John E. Donelson, Gene F. Lata, Bryce V. Plapp, Robert Roskoski, Jr. *assistant professors* Whyte G. Owen, Peter Rubenstein *associate* Denis R. Oliver
Degrees offered: B.A., B.S., M.S., Ph.D.

Undergraduate Programs

See "Biochemistry" in the Liberal Arts section of the *Catalog*.

Graduate Programs

The Department of Biochemistry offers both master's and doctoral programs. The Department offers the master's program independently, but master's theses are also presented by some Ph.D. candidates. The Department also offers opportunities for qualified and interested students to pursue M.S.-M.D. or Ph.D.-M.D. (Medical Scientist Training) combined programs.

The focus of the graduate program is on the individual student, whose educational needs are met in formal coursework and by tutorial conferences in the research areas from which he or she may choose a thesis topic.

First-year graduate students with adequate backgrounds take a general biochemistry course (99:130), physical biochemistry (99:135), a seminar on effective oral presentation (99:282), and elective courses. The student also spends about half of his or her time working in three different faculty laboratories (99:261), learning research techniques in the context of ongoing projects.

The second-year student chooses a research laboratory for his or her Ph.D. thesis research, begins the thesis project, and takes elective courses that supplement and complement the student's interests and preparation. Students are required to complete a minimum of 10 semester hours of 1-2 credit hour mini-courses in biochemistry (chosen from the 16 offered) and 8 semester hours of courses offered in other departments.

After passing the comprehensive examinations, toward the end of the second year, the student is formally admitted to degree candidacy, and concentrates on thesis work. The program culminates in the completion of this work, and its successful defense before the thesis committee.

In addition to meeting these and the general requirements of the Graduate College, the student is expected to assist in the teaching of biochemistry for two or three semesters, as part of his or her training.

Throughout the program, the student is associated with small seminar groups and receives close personal attention from the Biochemistry faculty member who serves as his or her research adviser.

Research Interests

The Department's current research interests include several aspects of physical biochemistry, effects of configuration on conformation and chemical and biochemical reactivity of the carbohydrates, hormonal control mechanisms, structure and function of nucleohistones, gene control in higher organisms, biochemistry of glycoproteins and carbohydrate-protein complexes, mechanisms and control of protein synthesis, biochemistry of proteinases, characterization of liver and hepatoma enzymes, neurobiochemistry, lipid metabolism, thermogenic mechanisms, conformational and allosteric investigation of glycolytic enzymes, analysis of enzyme systems utilizing cobamide and folic acid coenzymes, enzyme mechanisms, biosynthesis of active peptides and biochemical changes during development.

Facilities

The University Health Center's current $80-million expansion program provided new quarters for Biochemistry in the Basic Sciences Building in the spring of 1972. Biochemistry shares this new building with the departments of Anatomy, Microbiology, Pharmacology and Physiology-Biophysics. Research and teaching laboratories in each department are interspersed, and faculty members with common interests are grouped around cores of important research facilities and equipment, further helping to bring the various groups into a more intimate relationship with one another.

The individual staff research laboratories are large and uncrowded. The building also provides generous space for many common-use facilities, including instrument rooms, reading room, cold rooms, glassware kitchens and stockroom. Research is facilitated by good technical support in such areas as glassblowing, machine shops, animal quarters and electronics, and by services supplied by photographers, illus-

trators, a secretarial staff, stockroom supervisors, purchasing agent and technicians.

The Department is well supplied with virtually all of the equipment used in modern biochemical research, including analytical and preparative ultracentrifuges, fluorescence and nuclear magnetic resonance spectrophotometers, infrared absorption and optical rotatory dispersion instruments, amino acid analyzers, gas chromatographs, liquid scintillation counters, tank, plate and gel electrophoresis equipment, an electron microscope, instrumentation for protein X-ray crystallography, a computer and a number of Cary spectrophotometers.

In addition to the department reading room, excellent resources are provided by the new Health Sciences Library and the various other departmental branches of the University Libraries system.

Financial Assistance

Financial assistance is available to all students admitted to the doctoral program in Biochemistry.

Admission

The graduate program in Biochemistry is sufficiently flexible to accommodate students with a relatively wide range of backgrounds. Students with bachelor's degrees in any of the biological, biochemical or physical sciences are encouraged to apply. Requisite preparation includes advanced college-level coursework in physical chemistry, biology, physics and mathematics through calculus. Students with demonstrated ability may make up deficiencies after enrollment.

Beyond the general Graduate College admission requirements (see the Graduate College section of the *Catalog*), minimum requirements of the Department include an undergraduate grade-point average of 3.0 (A=4), with a 3.0 average in science and mathematics courses, and an acceptable score on the verbal, quantitative, and analytical sections of the Graduate Record Examination Aptitude Test.

Courses

99:100 Seminar Undergraduate 0-1 s.h.
Introduction to biochemistry; current developments; discussions of senior research. Required of all majors. No prerequisites.

99:110 Biochemistry 3 s.h.
One-semester lecture course focusing on chemistry and molecular dynamics of biological systems and mechanisms used to maintain them. Prerequisites: two semesters general chemistry, one semester organic chemistry.

99:120 The Chemistry of Biological Materials 3 s.h.
Chemistry of major functional groups in compounds in biological systems and factors which influence their reactivity; stereochemistry, properties of biopolymers, role of water, energetics and other topics. Prerequisite: 4:121.

99:130 Metabolism 3 s.h.
Molecular dynamics of biological systems; how energy is obtained, stored and utilized by living systems, how conversions of matter are achieved and controlled, how integrity of cell is maintained, how multicellular organisms function and how processes of differentiation are integrated. Prerequisite: 99:120.

99:131 Molecular Genetics 4 s.h.
Selected classical genetics; genes, chromosomes, gene mapping; pathways and control of nucleotide biosynthesis; DNA as genetic material; primary and secondary structure of DNA and RNA; biosynthesis of DNA, RNA and protein; interactions of protein and nucleic acid; transcriptional and translational control of protein synthesis; molecular biology of differentiation. Prerequisites: 99:120, 99:130, 37:128 or equivalent, with consent of instructor. Same as 37:171.

99:135 Physical Biochemistry 4 s.h.
Theory and interpretation of physical chemical measurements which relate to biochemical systems; topics include thermodynamics of macromolecules in solution, statistics of macromolecules, multiple equilibria, transport processes, kinetics, spectroscopy, light scattering and X-ray diffraction; three lectures, one conference. Prerequisites: 99:120, 22M:25-26, 4:131-132 recommended.

99:140 Experimental Biochemistry 4 s.h.
For graduate students and advanced undergraduates in biochemistry and other sciences; quantitative and qualitative experiments on identification, fractionation and characterization of constituents of biochemical systems; use of modern instruments and techniques for spectrophotometry, chromatography, electrophoresis, centrifugation and radioisotope studies; experimental design and interpretation emphasized. Prerequisites: 99:120, 4:16.

99:155 Research, Independent Study 2-6 s.h.
Students pursue course of independent study and research in area of interest to them; arrangements made by student with faculty member in advance of enrollment in course. Required in B.S. program. May be taken for Honors.

99:160 Biochemistry Tutorial 0 s.h.
For health science students. An introduction to modern biochemistry for students entering the health science colleges in the fall semester, and who have had insufficient chemistry background. Prerequisite: consent of instructor.

99:161 Biochemistry for Dental Students 4 s.h.
Course designed for dental students who have not had equivalent biochemistry, consists of lectures, demonstrations and conferences; other students admitted only after consultation with staff.

99:162 Biochemistry for Pharmacy Students 4 s.h.
Designed for pharmacy students who have not had equivalent biochemistry course; consists of lectures, demonstrations and conferences; other students admitted only after consultation with staff.

99:163 Biochemistry for Medical Students 6 s.h.
Designed for medical students; other students admitted only after consultation with staff; lectures, demonstrations and small group conferences, major objective to develop critical and analytical ability in breakdown of clinical problems into biochemical components.

99:164 Biochemistry for Physician's Assistant Students 3 s.h.
Aspects of general biochemistry necessary for understanding the biochemical basis of human disease; analysis of appropriate clinical cases. Taught concurrently and integrated with 72:164.

99:178 Advanced Genetics 4 s.h.
Same as 37:178, 61:178, 2:178.

99:203 Molecular Endocrinology 2 s.h.
Mechanism of action of peptide and nonpeptide hormones primarily in mammalian systems, including effects on cyclic AMP function, intermediary metabolism, transcription, translation and transport. Discussion of the stepwise molecular processes from hormone receptor interactions to biochemical and biological responses. Prerequisite: 99:120, 99:130, or consent of instructor. Same as 72:203.

99:204 Cellular Endocrinology 2 s.h.
Same as 72:204.

99:215 Genetics Seminar 0-2 s.h.
Lectures, discussions, seminars on selected topics in genetics. May be repeated. Prerequisite: 37:128 or consent of instructor. Same as 61:215, 2:215, 37:215.

99:218 Intro to Electron Optical Research Tech arr.
Same as 2:218, 37:218, 60:218, 61:218.

99:220 Bioorganic Mechanisms 1-2 s.h.
Chemical and structural basis of enzyme catalyzed transformations; requirements for enzyme catalysis; role of coenzymes and cofactors in catalysis. Prerequisites: 99:120, 99:130, 99:135 or consent of instructor.

99:221 Biochemistry of Disease 1-2 s.h.
Application of basic biochemical knowledge to the mechanisms underlying human disease, particularly those originating in metabolic defects; discussions based on original literature. Prerequisite: consent of instructor.

99:222 Motility and Contractile Systems 1-2 s.h.
Molecular mechanisms of locomotion in eukaryotic cells; chemical, physical, and morphomological criteria. Prerequisite: 99:120, 99:130 or consent of instructor.

99:223 Topics in Molecular Biology 1-2 s.h.
Intensive study of a specialized area of biochemistry; topics will change biannually; may be repeated for credit. Prerequisite: 99:120, 99:130, or consent of instructor.

99:226 Enzyme Kinetics 1-2 s.h.
Applications and limitations of steady state kinetics and transient state kinetics in determining mechanisms of enzyme reactions; discussion of basic definitions, assays, multisite and allosteric enzymes and multireactant systems. Prerequisite: 99:120, 99:130 or consent of instructor.

99:227 Protein Structure 1-2 s.h.
Review of the contemporary knowledge of the relationship of protein structure to biological function; roles of primary, secondary, tertiary and quarternary structures of proteins analyzed in detail, in terms of thermodynamics and dynamics of chain folding and stabilization; methodology employed in physical, chemical and biological characterization of proteins. Prerequisite: 99:120, 99:130 or consent of instructor.

99:228 Regulation Intermediary Metabolism 1-2 s.h.
Regulation of glycolytic pathway, tricarboxylic acid cycle, glycogen metabolism, Pasteur effect, fatty acid metabolism, amino acid and nucleotide biosynthesis; control of pathways by modification of enzyme activity, by hormones and by enzyme synthesis and degradation. Prerequisite: 99:120, 99:130, or consent of instructor.

99:230 Carbohydrates 1-2 s.h.
Chemical and physical properties and biochemical interconversions of simple and complex carbohydrates are studied and related to their roles in living systems; examples selected from naturally occurring sugars and carbohydrate containing biopolymers. Prerequisite: 99:120, 99:130, or consent of instructor.

99:231 Cell Surfaces 1-2 s.h.
Architecture of components of eukaryotic cell surfaces with emphasis on biosynthesis, intracellular mobilization, and export of membrane and secreted glycoproteins; intercellular recognition, via surface receptors for peptide hormones, lectins and toxins. Prerequisite: 99:120, 99:130, or consent of instructor.

99:232 Chromosome Biochemistry 1-2 s.h.
Chemical and structural properties of protein and nucleic acid components for the chromosome replication assembly, and gene expression; role of histones and DNA sequence complexity in chromosome structure; models for chromatin structure correlated with physical-chemical data. Prerequisite: 99:120, 99:130, or consent of instructor.

99:233 Physical Biochemical Techniques 1-2 s.h.
Independent study of experimental methods to accompany or follow 99:135; techniques include ultracentrifugation, spectroscopy, transient and steady-state kinetics, protein crystallography, electron microscopy, computer analysis of biochemical problems. May be repeated for credit. Prerequisite: 99:120, 99:130, registration in 99:135, or consent of instructor.

99:235 Biosynthesis Informational Macromolecules 1-2 s.h.

99:236 Bioenergetics 1-2 s.h.
Mechanisms for ATP generation by substrate level phosphorylation, oxidation, and photophosphorylation; composition and function of mitochondria and other energy-generating subcellular organelles and their relation; review of chemical coupling, conformational and chemiosmotic hypotheses for oxidation and phosphorylation. ATP utilization for biosynthesis, transport and locomotion. Prerequisite: 99:120, 99:130 or consent of instructor.

99:237 Topics in Biochemistry 1-2 s.h.
Intensive study of a specialized area of biochemistry; topic will change biannually. May be repeated for credit. Prerequisite: 99:120, 99:130, or consent of instructor.

99:238 Lipids 1-2 s.h.
Lipid metabolism and function primarily in animal systems; application of basic lipid biochemistry to current research in human diseases; physical and chemical properties of circulating lipoproteins and lipid transport in normal and diseased individuals. Prerequisite: 99:120, 99:130, or consent of instructor.

99:261 Research Techniques 1-5 s.h.
Only for graduate students in biochemistry; tutorial training in development and application of basic techniques in laboratory of staff member.

99:272 Seminar in Cellular and Molecular Biology 1 s.h.
Same as 37:272, 60:272, 61:272, 71:272, 72:272.

99:282 Seminar 1 s.h.
Required of graduate students in biochemistry; students participate in small, arranged student-faculty groups.

99:284 Advanced Techniques in the Neurosciences 1 s.h.
Same as 31:284, 37:284, 60:284, 71:284, 72:284.

99:292 Research Biochemistry arr.
Programs arranged with individual faculty members. Open only to graduate students in biochemistry.

Dermatology

Department head: John S. Strauss
Faculty: *professors* Richard M. Caplan, Donald T. Downing, John S. Strauss
associate professor Richard L. Zuehlke
assistant professor Roger I. Ceilley
clinical assistant professors Robert F. Godwin, James E. tenBroeke

The aims of the Department of Dermatology are the teaching of medical students and training of dermatology residents in the care of patients with skin disease. In addition, it provides opportunity for the development of research skills in the field of dermatology. This is one of very few dermatology programs in the country with a required rotation for medical students; each third-year medical student spends two weeks in the clinic and attends about 10 one-hour lectures.

A good cross-section of patients is available, due to the mixture of private and clinic patients, including a large number referred from the Student Health Service. Additional patients are seen at the nearby Veterans Administration Hospital.

Various electives are available for fourth-year medical students, including further clinical experience, dermatologic research and special studies.

Courses

62:1 Clinical Dermatology 2 s.h.
Basic dermatology; third medical school year; lectures, independent study materials, clinical experience.

62:2 Dermatology Elective arr.
Fourth-year medical students spend four weeks in advanced clinical experience, dermatologic surgery and special assignments.

62:4 Research in Dermatology arr.

62:5 Dermatology for P.A. arr.
General principles of medical research; clinical or laboratory projects; individualized study.

62:998 Special Studies on Campus arr.

62:999 Special Studies off Campus arr.

Dietetic Internship

Director of Dietetics: Rose Ann Sippy
Educational Coordinator: Beverly McCabe

University of Iowa Hospitals and Clinics offers a Dietetic Internship Program which qualifies graduates to take the American Dietetic Association registration examination. The program is fully accredited by the ADA.

Courses composing the program are administered by the University of Iowa College of Medicine. The following are required:

50:201-202 Nutrition Seminar	2 s.h.
50:203-204 Clinical Nutrition	4-8 s.h.
50:205-206 Projects in Nutrition	arr.
50:209-210 Hospital Dietary Administration	4-8 s.h.

The following are recommended electives:

50:215 Comparative Nutrition	2 s.h.
50:216 Analysis of Food Service Systems	2 s.h.
70:211 Nutrition of the Child	2 s.h.

Students generally complete the program with 15-17 semester hours of graduate credit. University Hospitals awards a certificate upon completion of the program.

Credit earned in the program may be applied toward an advanced degree, and approximately half of the graduates of the program do go on to complete advanced degree programs, most typically the master's degree in home economics, preventive medicine, health education, or business administration.

American Dietetic Association and University of Iowa Graduate College requirements for admission to the program include the bachelor's degree with a strong background in food and nutrition, food service management, and basic sciences.

Students must enter the program in the fall semester. The deadline for application is March 1.

University hospitals pays an internship stipend which partially covers educational and living expenses.

For description of program courses, see the "Nondepartmental" and "Pediatrics" listings in the College of Medicine section of the *Catalog*.

Endocrinology

Faculty: *professors* Nicholas Halmi (Anatomy and Physiology and Biophysics), Robert Fellows (Physiology and Biophysics), Daryl Granner (Internal Medicine and Biochemistry), Roy Pitkin (Obstetrics and Gynecology), Charles Read (Pediatrics), Lucas Van Orden (Pharmacology)
associate professors Joseph Brown (Internal Medicine), Frederick Chapler (Obstetrics and Gynecology), Gene Lata (Biochemistry), James Scranton (Anatomy), Barry Sherman (Internal Medicine), Robert Thompson (Pediatrics), Dianna Van Orden (Obstetrics and Gynecology)
assistant professors Robert Bar (Internal Medicine), David Dawson (Physiology and Biophysics), Barry Ginsberg (Internal Medicine), Felix E. Grissom (Physiology and Biophysics), John H. MacIndoe (Internal Medicine), Richard A. Mauer (Physiology and Biophysics)

Endocrinology is an interdisciplinary program involving faculty members from the departments of Anatomy, Biochemistry, Internal Medicine, Obstetrics and Gynecology, Pediatrics, Pharmacology, Physiology and Biophysics, and Zoology.

Degrees are not offered in endocrinology. Students whose primary interest is in endocrinology may enroll in the M.S. and/or Ph.D. programs offered by the departments cooperating in Endocrinology. As a rule, the course of studies for endocrinological emphasis encompasses offerings from several departments, and students may often find it appropriate to avail themselves of facilities of departments outside their parent department. Also, several of the Endocrinology courses are broadly interdepartmental with respect to the teaching staff, which often includes instructors from clinical departments.

Since endocrinology involves microscopic anatomy, physiology and biochemistry, students are expected to be well grounded in these disciplines. Further, since the endocrine system complements and links with the other great integrative system of the body, the nervous system, familiarity with neurobiology is also highly desirable in students of endocrinology.

With the aid of a Biological Sciences Development Award from the National Science Foundation, the University has added to its faculty in Endocrinology. Clinical departments have also substantially increased their strength in this area.

Courses

For course descriptions, see the appropriate departmental section.

Anatomy

60:118 Endocrinology for Medical Students 2 s.h.

Biochemistry

99:204 Cellular Endocrinology 2 s.h.

Physiology and Biophysics

72:203 Molecular Endocrinology 2 s.h.
72:204 Cellular Endocrinology 2 s.h.

Zoology

37:124 Comparative Physiology 2-4 s.h.
37:150 Introductory Endocrinology 2 s.h.
37:152 Endocrinology Laboratory 2 s.h.
37:225 Seminar: Endocrinology 2 s.h.
37:226 Seminar: Hormones and Behavior 2 s.h.

Family Practice

Department head: Robert E. Rakel
Faculty: *professors* Remi J. Cadoret, Robert E. Rakel *associate professors* Leonard E. Masters, Loran F. Parker, Reuben B. Widmer *assistant professors* William M. Clements, Rollo J. Coble, Jacqueline M. Dunbar, John Hess, Jr., John W. Lackman, Harold Moessner, Richard E. Munns, Glenys Williams, Jim L. Wilson *clinical assistant professors* Michael Abrams, Marie O. Alcorn, John C. Barker, Craig M. Champion, Mary P. Couchman, Phillip G. Couchman, Harley G. Feldick, Karl E. Jauch, Kenneth J. Judiesch, John K. Kammermeyer, Larry W. Lauhorne, George W. Marme, Gerald J. McGowan, Arthur Neumaier, Arnold T. Nielson, Howard E. Rudersdorf, Vern L. Schlaser, Donald D. Schmitt, Forrest W. Smith, Donald J. Tesdal, George J. Uhl, Charles A. Waterbury *clinical instructor* Michael E. Abrams *associates* Charles A. Honnold III, Richard W. Redman

The Family Practice program was initiated in answer to the need for more primary-care physicians in Iowa and throughout the nation.

Appropriate coursework in the Department is included throughout the four-year M.D. program. The Department's 18 elective senior rotations give students opportunities for exposure to various Iowa communities through work in affiliated hospitals or connected facilities, in the Department's Oakdale, Williamsburg and University Hospitals offices, and in preceptorships with selected family physicians throughout the state. There is also ample opportunity for independent study during the senior year, and an international health care elective offers exposure to primary health care systems of other countries.

Residency

The Department directs a three-year residency program, graduates of which are eligible for certification by the American Board of Family Practice. This residency trains physicians to provide continuing and comprehensive care to the total family unit, utilizing a concept integrating the patient, allied health professionals and the physician into an efficient and effective health care team.

The program is intentionally flexible to allow each resident freedom to tailor his or her training to individual interests and needs; it includes a broad spectrum of electives in internal medicine, pediatrics, obstetrics and gynecology, psychiatry, medical and surgical subspecialties and community medicine. The program currently offers 72 individual rotations.

The hospital-based clinical experience is a unique combination of exposure to practice in the University Hospitals, where the patients have been referred by physicians from all over the state, and in various community hospitals, where the inpatient care is of a nature more typical of family practice.

During the first year, a large portion of the program is based at Mercy Hospital in Iowa City, where residents have the opportunity for total participation in the practice—both inpatient and outpatient—of the private physician staff. Rotations are specifically designed to provide breadth of experience, and in the second and third years experience is available at Broadlawns Polk County, Iowa Lutheran and Blank Memorial hospitals in Des Moines, St. Joseph Mercy Hospital in Mason City, the Muscatine Community Health Center and the Red Oak Family Care Center, and selected teaching practices.

Teaching Fellowship

A two-year teaching fellowship in Family Practice begins each July 1. Its primary goal is to train physicians for academic roles in Family Practice departments or residency programs. Skills taught include research methodologies, administrative and teaching techniques, and modern educational methods.

Special Facilities

The Department office is located in Childrens Hospital in the University Hospitals Complex and is the center of Department activities. It contains faculty offices, the University Hospitals Family Practice Office and an inpatient unit. The Department also maintains Family Practice offices at the University's Oakdale Campus, four miles to the northwest, and at Williamsburg, 25 miles west of Iowa City. The Williamsburg office is the only medical office in that community. In all offices, patient families are assigned to a resident with

faculty supervision and are seen by appointment. Responsibility remains with that resident for the period he or she is in the training program. Emphasis is placed on teaching the principles of practice management, including organizational and administrative decision making, patient record and bookkeeping procedures and chart auditing methodologies as required to manage a private practice.

Courses

115:102 Human Dimensions in Medicine 1 s.h.
Weekly meeting of small groups of students for nonevaluative, noninvasive sharing; structured course is to last one semester, interested groups can continue.

115:201 Principles of Family Medicine 2 s.h.

115:401 Family Practice, Broadlawns arr.
Student participates in care of patients seen in Family Health Center; as time allows, student may participate in certain specialty clinics; student participates in all departmental conferences, noontime teaching conferences.

115:402 Emergency Room Outpatient Clinics, Broadlawns arr.
One of main objectives is to develop student's art and professionalism in delivering quality primary care; consent of Department required. Room and board provided. Dropping course allowed only if replacement is found.

115:403 International Health Care arr.
Exposure to primary health care delivery systems of other countries; positions available in Great Britain, Israel, Sweden, Australia, Germany and Canada, with others under development; individually arranged experiences may be submitted for approval. One, two or three months recommended. Consent of Department required.

115:404 Preceptorship in Family Practice arr.
Available with selected family physicians representing a variety of rural and urban practices in Iowa; solo practitioners and groups of varying sizes, affording each student the opportunity to select the type of situation he or she is most interested in investigating. Stipend: $12 a day plus traveling expenses. Consent of Department required.

115:405 Family Practice Clerkship, Cedar Rapids arr.
Four-week rotations in Family Practice Model Office, providing health care to patients whom the student follows for duration of clerkship; student also admits patients, under director's supervision, to Family Practice Inpatient Service at Mercy Hospital, designating diagnostic program and assuming responsibility for therapeutic design. Consent of Department required. Room and board not provided.

115:406 Emergency Room, Cedar Rapids arr.
Student participates in care of representative sample of patients coming to Emergency Room, maintains participation in care for those admitted, attends all house staff teaching conferences. Consent of Department required. Room and board not provided.

115:407 Family Practice Clerkship, Iowa Lutheran Hospital, Des Moines arr.
Student participates in care of patients in hospital, in emergency and ambulatory care center, and in family physicians' offices; attends all regular conferences and lectures at the Hospital; may also elect to spend time in other departments according to interests. Consent of Department required. Room and board provided.

115:408 U of I Family Practice Rotation arr.
Student participates in office management of patients, community activities of office, delivery of ambulatory primary care at Oakdale Family Practice office; develops appreciation for and ability to utilize skills of various paraprofessionals in total patient care. Assignment to offices determined by student's desires, patient load.

115:409 Family Practice, Mason City arr.
Student works with selected family physicians on staff at Mercy, Mason City, or other affiliated community hospitals in the area; responsible for management of all patients admitted by these physicians; participates in care rendered by all consultants involved; afternoons in Family Practice Office provide experience in primary care. Consent of Department required.

115:410 Independent Studies arr.
Student works with member of Department of Family Practice on investigational study of his or her choice. Study should be in field of family medicine, community medicine, health care delivery, health maintenance or similar areas. Consent of Department required.

115:416 Emergency Medicine, Davenport arr.
Student assigned to Emergency Room of either St. Luke's or Mercy Hospital, participates in care of a representative sample of patients, attends all house staff teaching conferences. Approval of Department required. Room and board supplied.

115:419 Family Practice Clerkship, Davenport arr.
Student is assigned problems seen most commonly in Family Practice Office; staff, including residents and faculty, follows student through history and physical, supports student in evaluation and diagnostic workups and treatment of each specific problem; student exposed to acutely-ill patients on services of medicine, surgery, obstetrics and pediatrics. Consent of Department required. Room and board provided.

115:420 Family Practice Clerkship, Sioux City arr.
Student is introduced to methods used in common medical practice oriented toward family practice; participates in care of patients seen by physicians and residents of Family Practice Program. Consent of Department required. Room and board provided when possible.

115:421 Family Practice Clerkship, Red Oak arr.
Student becomes a member of a private group "teaching practice," participates in care of patients in Family Care Center; following completion of clerkship, student will be experienced in the application of family practice concepts. Red Oak Family Care Center is the site of the Model Regional Primary Care Program.

115:422 Family Practice, Iowa Lutheran arr.
Gives student opportunity to study in-depth family practice with major interest in primary care of children; student works as junior resident; on call for pediatrics, attends deliveries, assists in care of newborn, sees patients in emergency room when time allows, assists with admissions.

115:423 Family Practice, Iowa Lutheran arr.
Student assits in care of adult patients under supervision of third-year residents, staff family physicians.

115:424 Senior Selective in Family Practice, Waterloo 2-4 s.h.
Family Practice rotation of 2-4 weeks at the Blackhawk Area Family Practice Center; student follows patients from outpatient care through hospitalization; teaches basic concepts of family practice; exposes student to the team concept in medical care.

115:425 Senior Selective in Emergency Outpatient Care 2-4 s.h.
Student participates in acute emergency care and management of acute illnesses at Schoitz Memorial Hospital, Waterloo, Iowa; participates in followup care when possible.

115:500 Family Practice Elective for Physician's Assistant Students arr.

115:501 Perspectives on the Process of Aging arr.
Religious, psychological, social, economic and physical aspects of aging. Fall. Same as 32:251.

115:502 Holistic Medicine Seminar 1 s.h.
Designed for teaching fellows in Family Practice; integrates psychosocial aspects of family medicine with traditional clinical medicine; correlates behavioral science and clinical medicine, deals with patient behavior and doctor-patient relationship.

115:503 Research Seminar 1 s.h.
Focus on application of research design to family medicine, integration of each fellow's research project into the discipline. Individual research projects discussed and critiqued in a regular ongoing manner.

115:504 Education Skills Seminar 1 s.h.
Designed for teaching fellows in Family Practice; fall semester devoted to task analysis, instructional objectives, teaching strategies and evaluation as they apply to clinical teaching; spring semester involves simulated or real experience in various clinical teaching situations.

115:510 Organization Development Seminar 1 s.h.
Designed for teaching fellows in Year II of the Fellowship in Family Practice; focus on administrative and academic issues emphasizing managerial style, form, and content, institutional politics, organizational development, grant-writing, and national health policy and its effect on family practice.

115:555 Family Practice I for Physician's Assistant Students 5 s.h.
Delivery of ambulatory primary care at family practice offices in Oakdale, Williamsburg and Des Moines; study of selected patients and their families; participation in staffing these patients; participation in departmental conferences and community projects.

115:556 Family Practice II for Physician's Assistant Students 6 s.h.

115:575 Family Practice Simulation Physican-Patient Encounter arr.

115:576 Interview and Interpersonal Skills Medical Practice arr.

115:998 Special Studies On Campus arr.
Individually arranged by student with approval of Department. Completed Summary of Individually Arranged Elective form must be submitted eight weeks prior to beginning of the rotation; allow a minimum of four weeks to complete the form.

115:999 Special Studies Off Campus arr.
Students who wish to arrange special clerkships which may include community hospitals may do so in this course. Completed Summary of Individually Arranged Elective form must be submitted eight weeks prior to beginning of the rotation; allow a minimum of four weeks to complete the form.

Genetics

The Ph.D. Program in Genetics is an interdepartmental program in which members of the departments of Biochemistry, Botany, Microbiology and Zoology, as well as a number of faculty members in clinical departments, participate. See "Genetics" under "College of Liberal Arts" for a list of participating faculty members, degree requirements and courses offered.

Hospital and Health Administration

Program director: Samuel Levey
Faculty: *professors* Gerhard Hartman, Samuel Levey *assistant professors* John T. Cirn, Robert M. Saywell, Jr., Charles E. Yesalis III *instructor* Robert L. Ludke *associate* Mary A. Beck *adjunct assistant professors* Robert D. Miller, John H. Staley, Kenneth H. Yerington *adjunct lecturers* B.F. Brown, Sr. Mary Venarda Lance
Degrees offered: M.A., Ph.D.

Since its inception in 1950, the Graduate Program in Hospital and Health Administration has offered two degree programs each having distinct, mutually reinforcing academic objectives.

The Master of Arts Program is designed for individuals who seek positions of executive leadership in health organizations.

The Doctor of Philosophy Program is oriented primarily to individuals who are interested in careers in teaching and research in the health fields, although individuals seeking senior managerial appointments in health organizations are also encouraged to apply.

The Master of Arts Program

The curriculum for the Master of Arts degree in hospital and health administration requires two years of full-time study. It is aimed at providing students with the knowledge, attitudes, and skills required to function in responsible managerial positions in hospitals, long-term care institutions, ambulatory care facilities, planning agencies, and related health organizations.

In the first year, courses are designed to familiarize students with the social, political, economic, and legal environments of hospitals and health care institutions. Concepts, tools, and techniques for effective and efficient managerial decision-making, planning, and control are introduced. The entire Program is founded upon an interdisciplinary approach which includes exposure to the theoretical and applied aspects of health systems management.

In the second year, the curriculum is oriented to the special interests and career objectives of individual students. An administrative residency may be arranged as an integral aspect of the program of study. Students will be provided with opportunities to concentrate in areas such as hospital administration, health planning, or long-term care administration.

Although a thesis is optional for the master's degree, students who wish to pursue doctoral studies are encouraged to engage in research leading to preparation of a thesis.

The normal program of study leading to the master's degree consists of fifty-four semester hours of graduate work. All master's students must complete eight required courses which represent a "core" set of disciplines and fields of knowledge. The courses are as follows:

80:101 Introduction to Health Care Organization	3 s.h.
80:102 Health Administration	3 s.h.
80:104 Economics of Health Care	3 s.h.
80:108 Legal Aspects of Health and Medical Care	3 s.h.
80:116 Quantitative Applications in Health Care	3 s.h.
80:122 Financial Management of Hospital and Health Institutions	3 s.h.
80:125 The Politics of Health Policy	3 s.h.
80:130 Issues in Health Administration	3 s.h.

In addition to electives offered by the Program, students are encouraged to take advantage of relevant courses offered by the Department of Preventive Medicine and Environmental Health in the College of Medicine, and in the colleges of Business, Nursing, Pharmacy, Education, and Liberal Arts.

The Doctor of Philosophy Program

The primary purpose of the doctoral program is to prepare scholars who are committed to the pursuit of excellence in teaching and research and in management and policy development in the health fields.

Applicants are generally expected to possess a master's degree in health administration, medical care organization, public health, or in other fields related to health. Qualified students may be admitted to doctoral study after completion of the baccalaureate.

An option available to students in the master's program permits filing a joint program for the M.A. and Ph.D. degrees.

At the doctoral level, the curriculum is organized into four basic fields of study, and students are expected to demonstrate competency in each:

Research Methodology and Quantitative Analysis
Health Systems Management and Evaluation
Political, Social, and Economic Aspects of Health Care
Medical Care Organization

Doctoral students will be exposed to advanced courses in health services management, health policy, and health services research. Doctoral candidates are required to complete at least 90 semester hours of graduate work, pass comprehensive examinations, and submit an acceptable dissertation.

In addition to satisfying the specific requirements of the Program, the doctoral student must satisfy the requirements of the Graduate College.

Admission procedures are the same for M.A. and Ph.D. students.

Admission

Qualified students with a baccalaureate degree, in any discipline, from an accredited college or university, may apply for admission.

Introductory undergraduate courses in accounting, economics, management, and statistics are program prerequisites. In special cases, at the discretion of the faculty, students may be permitted to complete the prerequisite courses subsequent to admission.

Students must have a 3.0 grade-point average for regular admission, although a studentt with a ower grade-point average may be admitted to conditional status upon the recommendation of the faculty.

All students applying for admission are required to furnish completed application forms, official transcripts of all graduate and undergraduate coursework, lettters of recommendation, and a brief statement outlining career objectives. Applicants are required to take the Graduate Record Examination and are encouraged to take the Graduate Management Admission Test. A personal interview is usually requested prior to admission.

Applicants are accepted for admission in the fall semester only, and early applications are encouraged. Completed applications must be filed not later than July 15.

Courses

80:101 Introduction to Health Care Organization 3 s.h.
Overview of major elements and issues relating to the organization, financing and delivery of health services; topics for discussion include the multidimensional nature of health and health services, evaluation of health organizations and health manpower, regulation of health systems, and planning for organization and delivery of services. Same as 63:181.

80:102 Health Administration 3 s.h.
Introduction to various health institutions and to selected functional areas of the institutions and their administrative staffs; historical development, organizational purposes, structure and processes, major issues, and administration of each institution and functional area. Field visits, readings, class interaction, written papers.

80:103 Hospital Administration 3 s.h.
Major decision areas confronting the hospital chief executive officer, including governance, accountability, medical staff organization and relations, inter-organizational exchanges, regulatory agency relationships, development of innovative programs.

80:104 Economics of Health Care 3 s.h.
Application of economic concepts of demand, supply, production, and investment to the health sector; emphasis on economic factors affecting allocation and utilization of health resources.

80:105 Comparative Health Care Systems 3 s.h.
Analysis of health organization, financing mechanisms, and delivery arrangements in various national settings: experience of other nations is reviewed within the context of the current status of health care arrangements and proposed legislation in the United States.

80:106 Advanced Hospital and Health Management 3 s.h.
Structured experience in designing and executing a research project focused upon analysis and prediction of community health needs and resource allocation, course objective is to apply problem-solving and analytic skills

80:107 Advanced Hospital and Health Management 3 s.h.
Continuation of 80:106.

80:108 Legal Aspects of Health and Medical Care 3 s.h.
Analysis of statutory and common-law framework within which the health care system operates; court decisions are used to illustrate how general legal doctrines are applied in hospital and health settings.

80:109 Sociology of Health 3 s.h.
Various concepts of health and disease, individual and societal reactions to illness and deviance, sociocultural factors affecting help-seeking behavior and medical practice, psychosocial dimensions of caring for the sick, sociological perspectives on the organization of medical services.

80:110 Ambulatory Care Administration 3 s.h.
Problems evolving from the widening array of institutions engaged in the delivery of ambulatory health care services: hospital-based, hospital-affiliated, and free-standing organizational forms, including review of profit and not-for-profit orientations; emphasis on internal issues such as manpower education and training personnel administration, clinic scheduling, and managerial accounting.

80:111 Thesis Health Administration arr.
Original study, review and presentation of a problem area in health-care administration.

80:112 Long-Term Care 3 s.h.
Chronic disease and long-term care facilities reviewed; organization and delivery of health care in nursing homes, intermediate care, and custodial care facilities are examined, with special emphasis on planning and evaluation of long-term care services.

80:113 Administration of Mental Health Facilities 3 s.h.
Organization, financing, and delivery of health care in mental institutions.

80:114 Administration Residency arr.
In selected instances, students may be provided with the opportunity for a residency placement in a health care organization. Residency placement interviews are usually arranged by faculty in consultation with preceptors and students.

80:115 Behavior and Design of Health Organizations 3 s.h.
Survey of major theories, concepts, models, and research from the social sciences, and their impact on improved understanding of health organizations. Cases are analyzed at both the strategic and operational levels.

80:116 Quantitative Applications in Health Care 3 s.h.
Application of quantitative decision-making to the health field, including an examination of the utility of the model-building approach in managerial decision-making; formulation, solution, and interpretation of various models. Examples from the field used extensively

80:117 The Dynamics of Health Organization 3 s.h.
The primary objective of this course is to introduce the student to the basics of organizational behavior emphasizing the psychology of the individual and groups. The determinants of innovation in organizations are discussed.

80:119 The Consumer and the Health Care System 3 s.h.
Possibilities and problems of direct consumer participation in the governance of health care institutions and delivery systems, and of citizen participation in the resolution of health policy issues, both normative and empirical analyses are made of various mechanisms for eliciting consumer input in health care organization; tactics of community organization, benefits and limits of health education for the public, evolution of the patients' rights movement.

80:120 Personnel Administration and Labor Relations in the Health Field 3 s.h.
Issues, problems, and challenges facing health care executives in building a capable work force and in managing personnel in hospitals and extended care facilities; policy formulation, recruitment and selection, training and development, wage and salary administration, morale, absenteeism, and union-management relations.

80:122 Financial Management of Hospital and Health Institutions 3 s.h.
Principles and techniques of hospital financial management, including budgeting, cash and inventories, cost analysis, plant and equipment management, financing, and sources of operating revenue.

80:123 Seminar: Hospital Finance arr.
In-depth analysis and evaluation of cost finding, budgeting, and reimbursement.

80:124 The Present and Future of Insurance arr.
Overview of the accomplishments and deficiencies of the commercial health insurance sector and various private and governmental programs aimed at reducing financial barriers to health care; critical political, economic, and administrative issues emerging in the debate over national health insurance (NHI); criteria to be used in evaluating workability and political feasibility of NHI proposals.

80:125 The Politics of Health Policy 3 s.h.
Selected dimensions of the processes by which public policies affecting health are generated, promoted, opposed, adopted, and implemented; emphasis on empirical political analysis, on the questions of who actually gets what in the health policy area, and how they get it; general perspectives on public policy-making, as framework for discussion of some major health policy issues.

80:130 Issues in Health Administration 3 s.h.
An analysis and discussion of contemporary and emerging issues related to the management of health institutions, health policy, and health planning.

80:166 Health Planning and Control Systems 3 s.h.
Systems approach to planning and evaluation of delivery networks in the management process; includes national planning legislation, planning models, constraints to fulfillment of operational objectives.

80:167 Seminar: Health Facility Design 3 s.h.
Facility planning, with emphasis on the construction process, spatial analysis and allocations, concepts in architectural design, role of the consultant. Ongoing projects at various institutions are reviewed where possible.

80:201 Seminar: Current Health Issues 3-4 s.h.
Intended for students who have completed an administrative residency or its equivalent. Topics determined by recent innovative developments in the organization and delivery of health care, and proposed or recently passed legislation.

80:202 Dissertation Seminar 3-4 s.h.
Individual research under faculty supervision for the preparation of the doctoral dissertation. Candidates for the doctorate are required to present seminars in their areas of research.

80:203 Seminar: Health Systems Management arr.
Case studies revolving about management as the primary integrative force in health organizations; major areas of executive action in the development of policy, organization, planning, information system, and control.

80:204 Seminar: Health Systems Management arr.
Continuation of 80:203 with emphasis on integration of various approaches to the field of management.

80:205 Health Services Research 3-4 s.h.
Fundamentals of problem formulation, design, and methodology; emphasis on evaluation of health systems.

80:206 Health Services Research 3-4 s.h.
Continuation of 80:205. Each student is required to defend a research protocol.

80:207 Independent Study and Research arr.
Arrangements may be made for a supervised tutorial course on a special subject. Under faculty guidance and supervision, qualified students may design, conduct, and complete a research project.

80:208 Seminar: Contemporary Health Services Research 3-4 s.h.

80:209 Advanced Seminar in Health Policy and Planning arr.

80:210 Advanced Seminar in Medical Care arr.

80:211 Advanced Seminar in Health Economics arr.

80:212 Epidemiologic Applications in Health Services 4 s.h.
Same as 63:205.

Internal Medicine

Department head: Francois M. Abboud
Faculty: *professors* Francois M. Abboud, Mark L. Armstrong, William B. Bean, George N. Bedell, James A. Christensen, James A. Clifton, Richard L. DeGowin, Gerald DiBona, Sam T. Donta, Richard Eckhardt, John W. Eckstein, Herman L. Falsetti, Annette Fitz, E. Lee Forker, Richard Freeman, Daryl K. Granner, Henry E. Hamilton, Robert C. Hardin, Donald Heistad, John C. Hoak, Kenneth Hubel, Lewis E. January, John E. Kasik, Richard E. Kerber, Allyn L. Mark, Hal Richerson, Harold P. Schedl, Phillip G. Schmid, Paul M. Seebohm, Raymond F. Sheets, Barry Sherman, Ian M. Smith, Philip R. Steinmetz, Ernest O. Theilen, John S. Thompson, Donald Zavala
professors emeriti Elmer L. DeGowin, William M. Spear
associate professors John J. Ambre, Verdain Barnes, Donald Brown, Joseph D. Brown, D. Patrick Burns, Michael Corder, David C. Funk, Walter J. Hierholzer, Lawrence Hunsicker, David T. Kaung, J. Michael Kroschos, Melvin Marcus, Jeanne M. Smith, M. Paul Strottman, Robert Summers, Carl White, Tai June Yoo
assistant professors Sinn Anuras, Robert Bar, Gerald Clamon, Loren Cohen, George Cooper, Barry Ginsberg, Charles M. Helms, Lynell W. Klassen, Douglas LaBrecque, William Lawton, Larry I. Lutwick, Richard D. Maca, John MacIndoe, Michael Massanari, W. James Metzger, Lawrence Norby, Edward Pesanti, Carl Richards, Roger Santala, Helmut C. Schrott, Konrad Schulze, John B. Stokes, Marc Thames, John Weiler
instructors James B. Martins, Kenneth Nugent
associates Alexander Carney, John Ellis, Geoffrey McLennan, Michael Petith
clinical associate professors Oscar C. Beasely, William Horsley, Erling Larson, Jae R. Lee, Edwin Motto, C.E. Schrock, George Spellman, Lawrence Staples, Paul VanLith
clinical assistant professors Rahm Bassin, Peter Black, M. Craig Champion, David Gordon, Richard R. Hankenson, Randall Hanson, Edward J. Herlko, Clark Hyden, Nathan Josephson, Manmohanlal Kwatra, Karl Larsen, David Lemon, John A. Nanson, Thomas R. Nicknish, John Olds, James Piros, Edward Posner, Jr., William C. Rosenfeld, Jaleel Siddiqui, Richard B. Trimble, John K. Uchiyama, Chad Williams, Javad Yans
clinical lecturers Basem Dajani, Thomas Ghrist, Daniel Glomset, Robert C. Larimer, Edward VanBramer, Dale Wassmuth

The Department of Internal Medicine is concerned with the diagnosis, prevention, and treatment of diseases of adults. The educational, patient-care, and research activities of the Department cover all facets of internal medicine, including general internal medicine and primary care as well as the specialized areas of allergy-immunology, cardiology, clinical pharmacology and oncology, endocrinology, gastroenterology, hematology, infectious diseases, renal and hypertensive disease, and rheumatology. The Department is organized into divisions in order to carry out these many functions.

Members of the Department bear a major share of the teaching of second-year M.D. students in Introduction to Clinical Medicine, where students begin to learn the pathophysiology, signs, symptoms, complications, prevention and treatment of disease. Students are taught to obtain histories, perform physical examinations and plan a rational approach to diagnosis and treatment.

In the third year, students are assigned for nine weeks to medical services at University and Veterans hospitals, under the guidance of the house staff and Department members, and actively participate as members of the ward team in diagnosis and treatment.

In the fourth year, students may select a clinical experience to fit their own plans from among courses offered in general medicine and the specialties.

Graduate Program

The Department offers straight internships and an approved residency program of high quality. In addition, most specialty divisions offer clinical and research fellowships for periods of one to two years. These permit the development of special knowledge and skills relevant to the specialty. Candidates for internship are accepted from approved medical schools. Postdoctoral fellows who have obtained their doctorates are also accepted for programs in which the major focus is laboratory research.

Facilities

Teaching occurs in the medical services and in the laboratories of the University hospitals in Iowa City, the Veterans Administration hospitals in Iowa City and Des Moines, and Iowa Methodist Hospital in Des Moines.

Courses

78:99 Cardiovascular Research and Special Study arr.
Independent research and study in basic research; introduction to problems of experimental design and execution of data collection and analysis in biologic systems. Open to M.D. students with background in mechanics and physiology. Prerequisite: preceptor's approval.

78:100 Internal Medicine Elective for Physician's Assistant Students arr.
Elective for Physician's Assistant Students.

78:101 Clinical Internal Medicine 9 s.h.

78:199 Advanced Cardiovascular Research and Special Study arr.
Special studies for research projects requiring some knowledge of hemodynamics, fluid mechanics, or mathematics; students assigned to investigators with work in progress. For graduate students. Prerequisite: approval of preceptor.

78:201 General Medicine Diagnostic Clinic arr.
Assignment for five days a week to general diagnostic clinic; clinical evaluation of medical problems; emphasis on diagnosis and management of common medical problems presented to internist in practice, as well as such aspects as management of office practice, prescreening of patients and computerization in ambulatory health care.

78:202 Medicine Consultation Service arr.
Emphasis on development of ability to assess and recommend medical therapy for hospitalized and ambulatory patients while acting in consultative role.

78:203 General Medicine Ward Elective arr.

78:250 Clinical Allergy Immunology arr.
Experience in diagnosis and treatment of problems in allergy and immunology emphasized; outpatients and inpatients evaluated by student under staff supervision; participation in interpretation of special studies carried out in allergy laboratory; subsequent correlation with specific clinical problems.

78:251 Survey of Immunology 3 s.h.
Lectures, discussion and demonstrations in basic principles of immunology and immunopathology. Same as 61:147.

78:258 Humanistic Medicine 2 s.h.

78:290 Research in Allergy Immunology arr.
Faculty-directed investigations in one or more areas chosen from those with which instructors are identified.

78:300 Clinical Cardiology arr.
Development of breadth and depth in diagnostic and therapeutic problems encountered in clinical cardiology; participation in evaluation and decisions regarding patients seen in Coronary and Intensive Care Units, inhouse consultations and Cardiovascular Clinic; familiarity with techniques and regimens of managing acute myocardial infarction, pre- and postoperative conditions and chronic states seen in postoperative patients during clinic follow-up visits.

78:302 Diagnostic Cardiac Catheterization Laboratories: University Hospitals arr.
Working up patients scheduled for cardiac catheterizations; personal involvement in use of noninvasive techniques in evaluating cardiovascular dynamics and in using electronic equipment to obtain phonocardiographic and various pulse-wave recordings; presence during procedures of right and left heart and coronary artery catheterization, and during interpretation and integrations of all pertinent data; student becomes conversant with methods, their applicability and limitations, their roles in total assessment of patients. Prerequisites, two-week course: Clinical Cardiology; four-week course: none.

78:304 Electrocardiography arr.
Instruction in scalar electrocardiography and vectorcardiography, and in exercise studies including submaximal treadmill testing; activities include initial interpretation of current tracings; daily conferences with staff for review of interpretations and for instruction in fine points of analysis and interpretations; treadmill studies in cooperation with one of cardiac fellows working in that area.

78:306 Lipid Metabolism—Atherosclerosis Clinic Research Center arr.
Broad knowledge of problems related to disorders of lipid metabolism and atherosclerosis provided, as well as clinical manifestations of arterial disease and their management; participation in activities in Lipid Clinic, consultation service, and Metabolic Laboratory.

78:310 Clinical Cardiology: Des Moines VA Hospital arr.
Work on Medical Service under supervision of instructors in cardiac and pulmonary disease; includes experience in electrocardiography and consultations in cardiovascular and pulmonary disease; also work under supervision in

cardiac and pacemaker clinics of Coronary Care-Intensive Care Units. Room, board provided at hospital; no facilities for spouses.

78:311 Coronary Care Training arr.

78:340 Cardiovascular Research and Special Studies arr.
Clinical research or more basic research in animal laboratory; survey in research methods and investigative techniques also offered as part of special studies program; provides introduction to problems of experimental design and execution of studies, including techniques involved in clinical research on human subjects as well as animal research; introduction to evaluation of data, including collation of data and statistical evaluation; work with investigators who have work in progress; effort made to give student experience in more than one area. Prerequisite: preceptor's approval.

78:345 Clinical Neurology: Veterans Administration Hospital, Des Moines arr.

78:350 Clinical Pharmacology and Therapeutics Clerkship arr.
Assignment to ward team but primarily responsible for knowledge of drugs all patients receive, correct methods of analyzing their therapeutic and possible adverse effects; therapeutic ward rounds made several days each week.

78:380 Clinical Pharmacology and Therapeutics Lecture Series 2 s.h.
Same as 71:380.

78:390 Research in Clinical Pharmacology arr.
Studies of effects of altered thyroid states on responses to drugs, new antihypertensive drugs in humans, new beta blockers in humans; interaction of drugs with cholestyramine; new cancer chemotherapeutic agents. Prerequisite: consent of instructor.

78:400 Clinical Endocrinology arr.
Participation in all clinical activities of Division of Endocrinology; evaluation of new patients and evaluation of inpatient referrals under supervision of resident and full-time staff; returning patients seen in diabetes and endocrine clinics; for each of these activities student expected to do complete patient evaluations and prepare chart including impressions, diagnostic program, and therapeutic plans; also active participation in clinical conferences of Division; oral presentation given to one of conferences.

78:410 Clinical Endocrinology: Veterans Administration Hospital, Des Moines arr.

78:440 Endocrine Research arr.
At least 12 weeks required, preferably six months to a year; participation in all organized educational activities of Division, as well as any portion of clinical activities which seem suitable; assignment to research laboratory of one of senior staff and participation in ongoing project. Prerequisite: instructor's consent.

78:445 Hospital Epidemiology 4 s.h.

78:450 Clinical Gastroenterology arr.
Patients seen on consultation service of University Hospitals; in conjunction with fellows and staff of section, results of student workups reviewed and further diagnostic and therapeutic recommendations made; presence for gastroenterology diagnostic procedures (endoscopy, gastric analysis, secretin test, intestinal biopsy, liver biopsy, etc.) and participation in biweekly research seminar, biweekly pathology conference, weekly clinical gastroenterology conference, and weekly gastroenterology rounds; does not include responsibilities in gastroenterology clinic.

78:490 Research in Gastroenterology arr.
Must be arranged with instructor.

78:500 Clinical Hematology-Oncology arr.
Study of basic mechanisms of anemia, white and red cell proliferative disorders and hemostasis-thrombosis states; study and review of diagnostic procedures used in hematology including bone marrow smears, peripheral blood smears and other important laboratory tests and specimens provided on inpatients or outpatients; application of diagnostic techniques and treatment procedures on patients with complex problems to learn management of patients with anemia, leukemia, lymphoma and coagulation problems; rotation includes both inpatient and outpatient clinical experience; additional study may be taken in specialized area of hematology (bone marrow morphology, hemostasis, cancer chemotherapy, etc.) after completion of 78:500.

78:510 Clinical Hematology-Oncology: Veterans Administration Hospital, Des Moines arr.

78:540 Research in Hematology arr.

78:550 Clinical Infectious Disease arr.
Diagnosis, treatment, follow-up and study of patients with infectious diseases, under staff guidance; other activities include learning techniques of diagnostic microbiology, participation in conferences and teaching activities of section and undertaking of investigation project of choice; audio-visual teaching aids available for study.

78:555 Internal Medicine for Physician's Assistant Students arr.

78:590 Research in Infectious Disease arr.
Research topics: rural infections, influenza infections in mice, experimental antibiotic study, staphylococcal infections in mice, experimental infections and biochemistry in tissue culture, septicemia and fungal infections.

78:600 Pulmonary Disease arr.
Emphasis on acquiring breadth and depth in diagnostic and therapeutic problems encountered in clinical pulmonary disease; outpatients and inpatients evaluated under supervision of staff; participation in interpretation of special studies carried out in pulmonary function laboratory and fiberoptic bronchoscopy and brush biopsy of lung; exposure to diagnosis and management of acute respiratory failure in Intensive Care Units at the University and Veterans Administration hospitals.

78:601 Research in Pulmonary Disease arr.
Faculty-directed investigations into one or more areas chosen from clinical pulmonary physiology, biopsy procedures in lung disease, pulmonary pathology, metabolic behavior of mycobacterium tuberculosis and/or various projects in clinical pharmacology. Consultation with instructor required for registration.

78:602 Medical Intensive Care Unit arr.

78:603 Pulmonary Disease Med Inten Care Unit: VA Hospital 4 s.h.

78:604 Pulmonary Disease Oakdale Ward Rotation 4 s.h.

78:610 Basic Science Approach to Lung Disease: VA Hospital, Des Moines arr.

78:650 Clinical Problems in Patients with Renal Hypertensive-Electrolyte Problems arr.
Emphasis on diagnosis and treatment of renal and hypertensive disease and of fluid and electrolyte problems; patients evaluated from inpatient service of University and Veterans hospitals, and from clinics; emphasis on examination of patients with relatively early kidney disease and hypertensive patients of all varieties; arrangements made to allow special emphasis on certain aspects of this broad program, and for short-term clinical studies.

78:651 Clinical Nephrology: VA Hospital, Des Moines arr.

78:652 Dialysis arr.
Medical management of patients with terminal renal failure; emphasis on metabolic, hematologic and cardiovascular aspects of uremia; techniques of center and home hemodialysis, pentoneal dialysis and cannula implantation; primary responsibility for selected patients at both University and VA hospitals assumed; special investigative projects anticipated, by arrangement with instructor only; under special circumstances, arrangement made for study in Europe.

78:653 Adult and Pediatric Nephrology and Hypertension arr.

78:654 Research in Renal Immunology arr.
With supervision student performs research project in an area of renal immunology, e.g., pathogenesis of glomerulonephritis or transplantation immunology, and attends clinical conferences on immunological topics.

78:662 Medical and Pediatric Endocrinology arr.
Same as 70:662.

78:680 Clinical Liver Disease arr.

78:690 Research in Renal, Hypertension and Electrolyte Disorders arr.
Elective; stresses laboratory investigation focusing on renal physiology; individual participates in ongoing research involving large and small animals, utilizing classical clearance methodology for studying aspects of sodium metabolism and influence of drugs thereon.

78:700 Clinical Rheumatology arr.
Clinical feature of various rheumatic diseases, their differential diagnosis, and principles of management learned; patients seen from arthritis clinic, inpatient consultation service of University Hospitals and the Veterans Hospital.

78:901 Office Practice of Internal Medicine arr.
Work with internist who is a member of the Iowa Clinical Society of Internal Medicine; obtain histories and perform physical examinations and, with internist, decide on proper course of diagnosis and management; focus on office practice of internal medicine; possible rounds at the hospital with preceptor.

78:902 General Medicine: Gundersen Clinic, LaCrosse, Wisconsin arr.

78:910 Inpatient Ward Service: Des Moines VA Hospital arr.

78:911 Clinical Gastroenterology VA Hospital, Des Moines arr.
Student participates in all clinical activites of the division, including consulations, gastrointestinal procedures, clinical consulations.

78:915 Inpatient Service: Iowa Methodist arr.

78:998 Special Studies on Campus arr.

78:999 Special Studies off Campus arr.
Individually arranged by student with approval of Department.

Medical Technology

See "Pathology."

Microbiology

Chair: Irving P. Crawford
Faculty: *professors* John Cazin, Jr., Irving P. Crawford, Rudolph P. Galask (Obstetrics and Gynecology), Louis G. Hoffmann, Allen J. Markovetz, Erich W. Six
professor emeritus J.R. Porter

associate professors George E. Becker, John E. Butler, Michael G. Feiss, Thomas L. Feldbush (Urology), William Johnson, David M. Lubaroff (Urology), Robert L. Richardson, Jose E. Rodriguez, Donald P. Stahly, Mark F. Stinski, Donald H. Walker
assistant professors Charles D. Cox, Norman A. Crouch
Degrees offered: B.S., M.S., Ph.D.

Undergraduate Program

See "College of Liberal Arts."

Graduate Degrees

The objectives of the graduate program are to help students become highly qualified in research and in the teaching of microbiology. These six areas are included in the program: pathogenic bacteriology, microbial genetics, immunology, microbial physiology, medical mycology, and animal virology. Several of these specialized fields involve interdisciplinary training within and outside the Department, so students receive broad experience during their course of study.

Usually the Department accepts only candidates for a Ph.D. degree, but a few students desiring a terminal M.S. degree may be accepted. Students working for the Ph.D. degree may obtain an M.S. degree during their graduate work, or proceed directly toward the Ph.D.

All students admitted as candidates for advanced degrees are expected to assist in teaching in the Department during their course of study.

Incoming students choose a research supervisor who serves as chair of the student's advisory committee. This committee assists the student in planning a program of study and reviews from time to time the progress in research.

The Department cooperates with other departments in the various colleges on the campus, affording ample opportunity for students to avail themselves of the University's diverse course offerings, seminars and research programs. For example, courses and seminars in clinical laboratory microbiology, genetics, cellular and molecular biology, and electron microscopy are taught on an interdepartmental basis.

M.S. Program

Course requirements for the M.S. student are the same as those for the Ph.D. program. The M.S. student must prepare a thesis based on his/her own research.

Ph.D. Program

A candidate for the Ph.D. must satisfy departmental course requirements determined by his/her advisory committee (minimum requirement: one course in each of four of the six subdisciplines available in the Department, or 15 semester hours of coursework in two different areas); pass a comprehensive examination; and write a thesis and defend it satisfactorily in an oral examination.

Facilities

The Department is housed in the Basic Sciences Building together with the departments of Anatomy, Biochemistry, Pharmacology, and Physiology and Biophysics. Adequate space and excellent equipment are available for teaching and research.

Graduate Admission

Prospective graduate students should become familiar with the general admission requirements of the Graduate College. Departmental requirements include a review and formal vote by the faculty before a student is admitted. Before beginning graduate work, the student must have completed courses in biology, chemistry (inorganic, organic, quantitative analysis), mathematics (up to calculus) and physics. Exceptions may be allowed, but students admitted without the above coursework must take it during the first year of graduate school. The student should have a grade-point average of 2.7 or better to be admitted to the graduate program in microbiology.

Courses

61:103 Medical Microbiology **arr.**
Principles and methods essential to study of microorganisms, their isolation and identification; microorganisms involved in infectious diseases; current concepts of immunology. Prerequisite: registration in College of Medicine.

61:104 Microbiology Elective **arr.**
For fourth-year medical students wishing to take additional coursework or research in medical bacteriology, medical mycology, immunology, virology or other subdisciplines.

61:110 Microbiology for Physician's Assistant Students **2 s.h.**
Introductory course in medical microbiology with emphasis given to the more commonly encountered pathogenic microorganisms and procedures useful in a physician's office. Prerequisite: registration as physician's assistant.

61:147 Survey of Immunology **3 s.h.**
Interdisciplinary survey of fundamentals of cellular and molecular immunology and application to clinical problems; appreciation of field as whole; involves faculty from the departments of Microbiology, Internal Medicine, Obstetrics and Gynecology, Radiology, Urology and others. Prerequisite: an introductory course in microbiology or biochemistry, or consent of course coordinator. Same as 78:251.

61:157 General Microbiology **4 s.h.**
Fundamental principles of microbial physiology, microbial genetics, virology, immunology and pathogenic microbiology. Laboratory includes methods used for isolating and identifying microorganisms. Corequisite: 4:121.

61:159 Pathogenic Bacteriology **4 s.h.**
Discussion of pathogenic bacteria with emphasis on mechanisms of pathogenicity and laboratory methods used for isolation and identification of bacteria; laboratory includes advanced methods used in study of pathogenic bacteria. Prerequisite: 61:157 and consent of instructor.

61:160 Microbial Physiology **3, 5 s.h.**
Microbial cell structure and function, growth, energy metabolism, biosynthesis and control mechanisms. Laboratory includes techniques for isolation of microorganisms, elucidation of metabolic pathways and study of microbial enzymes. Prerequisites: 61:157, a biochemistry course and consent of instructor.

61:161 Problems in Microbiology **arr.**
Student works on research problem under supervision of a faculty member. For undergraduate students with sufficient background. Prerequisites: 61:157 or equivalent, and consent of instructor.

61:162 Dental Microbiology **5 s.h.**
Introductory course covering bacteriology, immunology, pathogenic bacteriology, virology, oral microbiology. Open only to dental students.

61:163 Seminar: Microbiology **1 s.h.**
Lectures and discussions by faculty, students and guest speakers on current topics in microbiology and immunology.

61:164 Microbiology **4 s.h.**
Open only to nurses and dental hygienists.

61:165 Clinical Laboratory Microbiology **arr.**
Fundamental and practical training in isolating and identifying bacteria and fungi from clinical materials; offered cooperatively with State Hygienic Laboratory. Registration limited; departmental majors given preference. Prerequisite: 61:159.

61:166 Clinical Laboratory Microbiology **arr.**
Fundamental and practical training in viral isolation and the laboratory diagnosis of viral infections; offered cooperatively with State Hygienic Laboratory. Registration limited. Prerequisites: 61:157 and consent of instructor.

61:167 Experimental Immunochemistry **6 s.h.**
Laboratory-oriented course designed to provide practical experience with qualitative and quantitative methods for studying antigen-antibody reactions, preparing and purifying antigens and antibodies, evaluating immunochemical data; lectures provide understanding of theoretical foundations of laboratory procedures and discuss application to resolving current biological problems. Prerequisite: 4:101; 61:147 or 99:120, and consent of instructor.

61:168 Animal Virology **4 s.h.**
Basic mechanisms of virus-cell interactions and the role of viruses in disease. Prerequisites: 61:157, introductory biochemistry and consent of instructor.

61:169 Medical Mycology **4 s.h.**
Basic techniques used in study of fungi pathogenic for man and lower animals. Prerequisite: introductory course in microbiology. Same as 2:137.

61:170 Microbial Genetics **3 s.h.**
Genetics of bacteria and bacteriophages. Optional supplement is laboratory course 61:175 (offered the same semester as 61:170). Prerequisite, 61:157 or consent of instructor.

61:171 Honors Microbiology **arr.**
Introduction to experimental research. Open to juniors and seniors with at least a 3.0 grade-point average overall and 3.2 in microbiology.

61:172 Honors Microbiology **arr.**
Prerequisite, 61:171.

61:173 Laboratory Methods in Cellular Immunology **3.5 s.h.**
Intermediate-level course in immunology designed to acquaint graduate students, clinical trainees and fourth-year medical students with fundamental theories of cellular immunology and methods used for investigating these theories, emphasis placed on role of lymphocytes in both humoral and cell-mediated immunity. Prerequisites: 61:103 or 61:147 and consent of instructor.

61:175 Microbial Genetics Laboratory **1 s.h.**
Experiments illustrating basic principles of genetic analysis in bacteria and bacteriophage. Corequisite: 61:170 concurrently or consent of instructor.

61:178 Advanced Genetics **4 s.h.**
Same as 2:178, 99:178, 37:178.

61:207 Molecular Immunology **3 s.h.**
Advanced lecture-seminar course covering two major topics per semester. Topics vary on a three-year cycle, so course may be repeated a maximum of three times. Topic rotation: 1978-79: biochemistry and biology of the complement system, advances in immunochemical methods. 1979-80: immunoglobulin structure, genetics and evolution, chemical basis of antigenicity. 1980-81: immunochemistry and biology of secretory immunity, theoretical models of immune phenomena. Prerequisite: 61:167 or consent of instructor.

61:215 Genetics Seminar **0-2 s.h.**
Same as 37:215, 2:215, 99:215.

61:217 Cellular Immunology **3 s.h.**
Structure, development and function of immunocytes, antibody formation, hypersensitivity, immunopathology; topics vary yearly, on a three-year cycle, may be taken repeatedly. Prerequisites: 61:173 and consent of instructor.

61:218 Intro to Electron Optical Research Tech **arr.**
Prerequisite: consent of instructor. Same as 60:218, 2:218, 37:218, 99:218.

61:220 Advanced Electron Optical Rsch Technique **arr.**
Same as 60:220, 2:220, 90:220.

61:260 Topics in Microbial Physiology **arr.**
Discussion of current ideas and concepts in microbial physiology and metabolism. Prerequisite: consent of instructor.

61:261 Research: Microbiology **arr.**
Open to candidates for advanced degrees in microbiology.

61:268 Topics in Animal Virology **1 s.h.**
Current research in animal virology, may be repeated; topics vary. Prerequisites: 61:168 and consent of instructor.

61:270 Topics in Molecular Biology **arr.**
Lectures and seminars on selected topics; may be repeated; topics vary. Prerequisite: consent of instructor.

61:272 Seminar in Cellular and Molecular Biology **1 s.h.**
Same as 37:272, 60:272, 71:272, 72:272, 99:272.

Neurology

Department head: Maurice W. Van Allen
Faculty: *professors* Maurice Van Allen, William E. Bell (Pediatrics), Arthur L. Benton (Psychology), Richard Fincham, Jan Kimura
associate professors Antonio Damasio, Robert Rodnitsky, Gary M. Van Hoesen (Anatomy)
assistant professors Harold Adams, E. Peter Bosch, Enrique Chaves (Pediatrics), James Corbett, Hanna Damasio, Lynn Lyon, John McKee, John J. Murphy, Dorothy Schottelius, Thoru Yamada
assistant research scientist Kerry Hamsher
research scientist Hrvoje Lorkovic
Joint appointments: *professors* William E. Bell (Pediatrics), Arthur L. Benton (Psychology)
assistant professor Enrique Chaves (Pediatrics)

Neurology is the branch of medical science concerned with disorders of the brain, spinal cord, and peripheral nervous system, their diagnosis and management. Teaching and postgraduate training in this field, carefully integrated with patient care, has long been a significant function of the Department.

The Department offers clinical and clinical research training to third- and fourth-year medical students, contributing to the Doctor of Medicine degree. An active three-year approved residency program qualifying physician trainees for board certification in neurology is a major aspect of departmental activity. Experience in the Division of Clinical Electrophysiology, as well as in pediatric neurology, psychiatry and neuropathology in conjunction with these departments is part of this training. The Department of Neurology also offers research opportunity in behavioral neurology to candidates for the degree of Doctor of Philosophy in psychology.

Investigative interests of the staff center on speech disorders, dichotic listening, behavioral abnormalities based on disease of the nervous system, electrophysiological correlates of disease, and biochemistry of the anticonvulsant drugs. The Department sponsors an active muscle physiology laboratory. The Department has conducted the Central Registry for the International Cooperative Aneurysm Project, funded by the National Institutes of Health.

Courses

64:11 Clinical Neurology **2 s.h.**
Ward teaching and bedside examinations in small groups, or management of ambulatory patients. Third year.

64:112 Principles of Neurology **2 s.h.**
Lectures, demonstrations, and case presentation of neurologic disorders usually treated by therapists; anatomy of nervous system reviewed and methods of electrical testing of nerve injuries demonstrated.

64:201 Research Neurology **arr.**

64:207 Introduction to Behavioral Neurology **2 s.h.**

64:300 Advanced Clinical Neurology **arr.**
Intensive period of experience dealing with diagnosis and management of patients with neurologic disease; either inpatient or outpatient areas may be elected, but not simultaneously; student performs initial assessment of patient and, through consultation with staff, outlines management; inpatients become continuing responsibility of student. One student for each area; course period minimum one month. Offered all year.

64:301 Research Projects in Clinical Neurology **arr.**
Student plans and conducts, with instructor, original projects of clinical nature in cerebrovascular disease, convulsive disorders, demyelinating disease, degenerative diseases, or neuromuscular diseases; research of appropriate quality submitted for publication; library research as well as pertinent observations on study population included. One student; course period three months. Offered all year.

64:304 Neurochemistry **arr.**
Guided readings in special areas of biological chemistry as related to neurological diseases; selected demonstrations of laboratory techniques. One student; course period one month. Offered all year.

64:305 Behavioral Neurology and Language Disorders **arr.**
Supervised study of types of behavioral impairment and aphasic disorders shown by patients with nervous disease; their significance for identifying presence, extent, and locus of cerebral lesions. One student; two months; offered all year.

64:310 Cerebrovascular Disease **arr.**
Experience in evaluation and management of patients with cerebrovascular diseases. Students attend conferences and clinical rounds.

64:998 Special Studies on Campus **arr.**

64:999 Special Studies off Campus **arr.**

Nuclear Medicine Technology

Director: James H. Christie
Program coordinator: Glenn A. Isserstedt
Faculty: *professors* James H. Christie, Richard E. Peterson
associate professors Frank H. Cheng, James C. Ehrhardt, Raymundo T. Go
instructor Glenn A. Isserstedt
clinical instructors Robert J. LaDue, Kenneth Breslow
Degree offered: B.S.

Nuclear medicine technology is the portion of the allied health professions field which encompasses the techniques of using radionuclides in medicine. New techniques for studying body processes and imaging organs and disease sites have generated the development of nuclear medicine. Simultaneously, a wider variety of sophisticated equipment unique to the field has come into use, along with an increasing variety of radionuclides and radiopharmaceuticals. The breadth of these specialized procedures, in addition to

volume demands, led to the development of this new allied health occupation.

Nuclear medical technologists work predominantly in hospitals and clinics in all phases of radionuclide uses in medicine: daily preparation of radiopharmaceuticals for use in patients; preparation of patients for organ imaging, blood flow studies, metabolite absorption and utilization studies, or quantification of total body content of a variety of substances; carrying out any of the above studies, including preparing image or data records for physician review; using reagents tagged with radionuclides in a variety of highly specific and sensitive assays of hormones, drugs in blood, urine.

The Program at Iowa

The program in Nuclear Medical Technology at Iowa is accredited by the Council on Medical Education of the American Medical Association. Fulfillment of the requirements established by the AMA Accreditation Board involves three years of preclinical work in the College of Liberal Arts and a minimum of 12 months of professional clinical experience, available in the University of Iowa Medical Center.

Upon satisfactory completion of the entire four-year program, the student receives the Bachelor of Science degree with a major in general science and nuclear medical technology, and is eligible for national certification as a nuclear medicine technologist.

Preclinical Program

The required preclinical courses emphasize the physical and biological sciences, which provide a basic background and which are prerequisites for the subjects and activities of the clinical year. The following is a summary of the prerequisites for acceptance into the Nuclear Medicine Technology Program:

Satisfaction of the College of Liberal Arts general requirements, and the requirements for a general science major;
A minimum of 36 semester hours distributed 16-12-8 among chemistry, zoology and physics;
A minimum of 6 semester hours in mathematics; and
A minimum of 96 semester hours in all coursework with a 2.0 minimum cumulative grade-point average.

Clinical Program

The clinical year is centered in The University of Iowa Medical Center. In terms of time allocation, both classroom and clinical experiences are emphasized. The classroom portion covers in depth the clinical or technical specialties of physics of nuclear medicine, basic instrumentation, scanning instrumentation, radiochemistry, radiopharmaceuticals, electroporesis, chromatography, liquid scintillation health physics, principles of nursing care techniques, principles of clinical administration, doctor's conference and scan critique, fundamentals of microbiology, clinical chemistry, kinetic studies,and medical ethics. *In vitro* clinical experience rotations are established in radioassay procedures, clinical radiopharmaceutical laboratory, tracer techniques and research application, thyroid function studies and rectilinear and camera scanning, and in kinetic studies *in vivo*.

Admission

Prospective students in nuclear medicine technology are encouraged to apply for study and to provide a transcript of previous work as early as possible in the preclinical program, since the class size is at present limited to six students, and prerequisites are increasing in importance. Personal interviews required. Successful applicants for the clinical training program are notified of their selection at least three months before the beginning of the next clinical class. At present, the 12-month clinical training program starts in September of each year.

Obstetrics and Gynecology

Department head: R.M. Pitkin
Faculty: *professors* Herbert J. Buchsbaum, F.K. Chapler, R.P. Galask, C.P. Goplerud, W.C. Keettel, R.M. Pitkin, D.E. Van Orden
associate professors C.A. deProsse, L.R. Hughes, R.M. Kretzschmar
assistant professors Albert W. Bostrom, Dwight P. Cruikshank, S.G. Lifshitz, F.J. Zlatnik
associate Douglas W. Laube

Coursework for M.D. Students

The courses in obstetrics and gynecology are designed to give M.D. students a comprehensive survey of female reproductive problems. This is done through a series of didactic lectures, inpatient and outpatient assignments, ward rounds, teaching seminars and special elective courses.

The third-year clerkship (66:4 Clinical Obstetrics and Gynecology) gives the student a core of information he or she will need to be prepared to care for women no matter what his or her career choice.

In the fourth year a variety of electives is available, intended to train the student in the skills of obstetrics and gynecology in a private hospital setting or in a multispecialty clinic. These electives include rotations at Broadlawns Polk County Hospital, Des Moines; Ochner Clinic and Conway Memorial Hospital, Monroe, Louisiana; Medical Associates, Dubuque; Methodist Hospital, Des Moines; and The Gundersen Clinic, LaCrosse, Wisconsin, in addition to clerkships at the University of Iowa Hospitals and Clinics.

Residency Program

The Department offers a four-year residency. After passing a written and oral examination, graduates are eligible to be certified as specialists by the American Board of Obstetrics and Gynecology.

During the four years, the resident rotates through the various divisions of the Department and cares for both hospital inpatients and outpatients. Additional training is obtained in prenatal clinics and in Waterloo, Cedar Rapids and Davenport. During the final year, the resident spends time at Methodist and Broadlawns Hospitals in Des Moines and at St. Luke's Hospital in Davenport. In the four year rotation, the resident is trained in normal and abnormal obstetrics, advanced gynecologic surgery, office gynecology, endocrinology, oncology, family planning and endoscopic procedures. Advanced specialty training after the completion of the residency is available in endocrinology, oncology, and maternal-fetal medicine.

Fellowship Programs

Gynecologic Oncology

The Department offers a two-year fellowship in gynecologic oncology. This involves clinical and research activities. After passing the written and oral examinations, fellows are eligible to be certified by the American Board of Obstetrics and Gynecology for Special Competence in Gynecologic Oncology.

Endocrinology

The Department offers a two-year fellowship in endocrinology. This involves clinical and research activities. Fellows are eligible, after passing the written and oral examinations, to be certified by the American Board of Obstetrics and Gynecology for Special Competence in Endocrinology.

Maternal-Fetal Medicine

The Department offers a two-year fellowship in maternal-fetal medicine. This involves clinical and research activities. After passing the written and oral examinations, fellows are eligible to be certified by the American Board of Obstetrics and Gynecology for Special Competence in Maternal-Fetal Medicine.

Courses

66:4 Clinical Obstetrics and Gynecology 6 s.h.
Clerkship designed to develop proficiency in special history-taking and physical examination of obstetric and/or gynecologic patient, as well as concepts of diagnostic techniques and therapy; special attention to outpatient gynecology, family planning and techniques for early detection of gynecologic cancer.

66:6 Advanced Obstetric Clerkship: Iowa City arr.
Student works up new patients in High Risk Obstetric Clinic; is involved in continuing antepartum care; is responsible for workup of the majority of the complicated patients admitted to the Obstetric Ward and, under supervision, orders diagnostic studies and follows their course; assists in various diagnostic and therapeutic procedures such as nonstress testing, stress testing, amniocentesis, amniography and intrauterine fetal transfusion.

66:7 Advanced Obstetric Clerkship: Iowa Methodist Hospital, Des Moines, Iowa arr.
Essentially same as 66:6; room and board provided; transportation is student's responsibility. One student, four weeks. Offered all year.

66:9 Advanced Gynecologic Clerkship arr.

66:10 Gynecologic Oncology arr.

66:13 Gynecologic Endocrinology (Clinical) arr.

66:14 Gynecologic Endocrinology (Research) arr.

66:16 Advanced Obstetric-Gynecologic Clerkship: LaCrosse, Wisconsin arr.

66:17 Advanced Obstetric Clinical Clerkship: Broadlawns Hospital, Des Moines arr.

66:18 Advanced Obstetric Clerkship: Davenport arr.

66:20 Advanced Obstetric Clerkship: Dubuque arr.
Duties and responsibilities similar to 66:6, with addition of outpatient experience in closed-group, multi-specialty practice. One student, four weeks. Offered all year. Room and board provided.

66:21 Advanced Obstetric Clerkship: Monroe, Louisiana arr.
Work at Conway Memorial Hospital, a 250-bed hospital serving indigent population of southwestern Louisiana; obstetrics-gynecology service staffed by LSU residents.

66:27 Advanced Obstetric Clerkship: Waterloo arr.

66:100 Obstetrics and Gynecology for Physician's Assistant Students arr.

66:110 Obstetrics and Gynecology: Physician's Assistant Elective arr.

66:147 Survey Immunology 3 s.h.

66:998 Special Studies on Campus arr.

66:999 Special Studies off Campus arr.

Ophthalmology

Department head: Frederick C. Blodi
Faculty: *professors* Frederick C. Blodi, Sohan S. Hayreh, Hansjoerg E. Kolder, Karl C. Ossoinig, H. Stanley Thompson, Robert C. Watzke
associate professors Thomas C. Burton, Jay H. Krachmer, Charles Phelps, William E. Scott
assistant professors Richard Anderson, James G. Diamond, G. Frank Judisch, Jay H. Krachmer, John Mensher, Thomas A. Weingeist
Degree offered: M.S.

Ophthalmology is a medical and surgical specialty concerned with research, diagnosis, and treatment of diseases of the eye and its adnexa, including correction of refractive errors. Several subspecialties are represented in the Department: ocular pathology and physiology, pediatric ophthalmology, retinal disorders, glaucoma, neuro-ophthalmology, echography, cornea and external diseases, vascular diseases, plastic surgery, contact lens and refraction service, and medical ophthalmic photography.

The teaching program is directed toward the training of medical students and resident physicians. It emphasizes a scientific approach to problem-solving in diagnosis and treatment.

The residency program lasts three and a half years, and culminates in qualification for the examination of the American Board of Ophthalmology.

The Master of Science degree is not offered as a primary professional objective but can be pursued in conjunction with a residency program only.

Facilities

The Department maintains several research laboratories: tumor diagnosing, pathology and electron microscopy, electrophysiology, microbiology, pupillography, and vascular diseases. Clinical facilities are available not only at the University Hospitals, but also at the VA hospitals in Iowa City and in Des Moines. The Department also runs an eye clinic at the Broadlawns Polk County Hospital. The Department sponsors biennially an international symposium, annually a national conference, and monthly a statewide program of continuing education.

Two features of the Department are outstanding: a large full-time faculty, and the opportunity to prepare for a career of teaching and research in ophthalmology.

Courses

67:100 Elective in Ocular Pathology and Physiology arr.
Four-week course involving student in ocular pathology and physiology by grossing of ocular specimens, reading of histologic slides, studying of reference assignments, examining teaching collection of slides, and self-assessment examination.

67:101 Elective in External Eye Disease 4 s.h.

67:102 Elective in Neuro-Ophthalmology arr.
Four-week course in neurology, neurosurgery, or internal medicine; emphasis on visual and ocular motor dysfunction due to neurologic disease; patients worked up; assigned reading; neuro-ophthalmology rounds every afternoon.

67:103 Elective in Pediatric Ophthalmology arr.
For those interested in ophthalmology and pediatrics; two-week course consisting of clinical workup of squint patients, daily strabismus and reading assignments, as well as self-assessment program.

67:104 Elective in Glaucoma arr.
Four-week course in ophthalmology and general practice; emphasis on screening and provocative tests, as well as long-term medical management; participation in field trips for glaucoma screening.

67:105 Introduction to the Examination of the Eye arr.
Four-week course for those with particular interest in ophthalmology; covers ocular history, visual acuity, intraocular pressure, extraocular muscles, pupillary responses, slit lamp examination, and fundus examination; includes introductory material for first-year residents in ophthalmology.

67:106 External Disease of Eye 4 s.h.
Four-week course in external diseases of eyes, specializing in acute infection and corneal diseases; includes detailed examination, medical treatment, and keratoplasty.

67:201 Ophthalmology 6 s.h.
Intensive course in basic and clinical sciences related to ophthalmology; limited to resident physicians who have been accepted by Department for residency; didactic lectures, seminars, laboratory work, and research offered; clinical training connected with course in keeping with requirement of American Board of Ophthalmology.

67:202 Research in Ophthalmology and Thesis 12 s.h.
Resident expected to develop laboratory or library project; this may lead to a Master of Science degree, provided Graduate College requirements are met and acceptable thesis presented; requirements include aspects of statistics, electronics, and animal care.

67:998 Special Studies on Campus arr.

67:999 Special Studies off Campus arr.

Orthopaedic Surgery

Department head: Reginald R. Cooper
Faculty: *professors* Michael Bonfiglio, Reginald R. Cooper, Adrian E. Flatt, Vittorio A. Pedrini, Ignacio V. Ponseti
professors emeriti Carroll B. Larson, Genevieve Stearns
associate professors John P. Albright, Richard A. Brand, Jerry A. Maynard, Bruce L. Sprague
assistant professors Merlin P. Strottmann, Michael R. Mickelson, Stuart L. Weinstein

The Department offers two types of postgraduate training—a five-year integrated clinical program in which the intern and resident participate simultaneously in inpatient care, outpatient care, surgery, and sciences related to the neuromusculoskeletal system, and a five- or six-year program for those interested in full-time academic orthopaedic careers.

The Clinical Program

Trainees enter this program through the National Internship Matching Plan directly out of medical school. This program consists of a one-year categorical diversified orthopaedic internship and four years in orthopaedic residency.

During the internship year, the trainee gains experience not only in clinical orthopaedics, but in medicine, pediatrics, neurology, surgical specialties, intensive care and anesthesiology.

During the following years, residents gain experience in trauma, children's orthopaedics, adult orthopaedics, neuromuscular disorders, rehabilitation, prosthetics and orthotics, rheumatology and basic science as related to orthopaedics. The residents take specialized courses in anatomy, bone histology, biochemistry, physiology and pathology.

A weekly seminar covers biomechanics, kinesiology and selected clinical subjects. Residents also attend the Northwestern University courses on lower extremity amputees and prosthetics.

Program for Full-Time Academic Orthopaedics

This program includes the usual training described under the clinical program above. In addition to this, the resident devotes one or two years to research. This research may be in any field in which the resident is interested provided it is related to the musculoskeletal system. This research may be done in one of the five orthopaedic laboratories or in a basic science department.

Departmental Laboratories

The orthopaedics laboratories deal with problems in these major subject areas:

Biochemistry—The biochemistry of mucopolysaccharides and collagen, both normal and those altered in epiphyseal dysplasias and scoliosis.

Biomechanics—In conjunction with the College of Engineering, biomechanical problems of the upper extremity and biomechanics of the hip and the gait, and total joint replacements.

Cell biology and pathology—Ultrastructural studies on normal bone, cartilage, tendons and muscles, and on those altered by experiment and disease.

Tissue transplant, radioactive isotopes and metabolic bone disease—Skin, bone and cartilage transplantation and various aspects of mineral composition and bone density in metabolic bone disease.

Facilities

The Department is housed in Children's Hospital, and has an active service in the nearby Iowa City Veterans Administration Hospital.

Facilities include 120 beds, an outpatient clinic, a specialty library, a specialty radiology unit, a brace shop, and physical therapy facilities.

Physicians in the outpatient clinic see approximately 100 patients a day.

Specialty clinics deal with such problems as scoliosis, club feet, congenital dislocated hips, neuromuscular disease, metabolic diseases, amputees, hips, knees, hands, neoplasms, and trauma.

Approximately 1,500 major operations are performed each year under auspices of the Department.

The Department provides consulting service to the Hospital School for Handicapped Children, State Services for Crippled Children, and two state schools for the mentally retarded.

Courses

76:2 Clinical Orthopaedics arr.

76:102 Orthopaedics for Physician's Assistant Students arr.

76:105 Rehabilitation Elective For Physician's Assistants arr.

76:201 Advanced Clinical Orthopaedics arr.
Open to senior medical students only.

76:202 Musculoskeletal Trauma arr.
Open to senior medical students only.

76:203 Surgical Care of the Hand arr.
Open to senior medical students only.

76:216 Laboratory Experience arr.
For senior medical students only.

76:998 Special Studies on Campus arr.
Open to senior medical students only.

76:999 Special Studies off Campus arr.
Open to senior medical students only.

Otolaryngology and Maxillofacial Surgery

Department head: Brian F. McCabe
Faculty: *professors* Janusz Bardach, Charles Kremenak, William LaVelle, Brian McCabe, Hughlett Morris, William Olin, D.C. Spriestersbach, Duane Van Demark
professor emeritus Scott Reger
associate professors Charles Anderson, Lee Harker
associate professor emerita Jeanne K. Smith
assistant professors Richard Babin, Robert Bumstead, William Panje, Richard Voots
research scientists Dave Kuehn, Jai Ryu
clinical professor Clair Kos
clinical associate professors Guy McFarland, Roger Simpson
clinical assistant professor Carl Betts
Degree offered: M.S.

The Department provides one of the oldest and largest otolaryngology and maxillofacial surgery training programs in the world. Currently there is a full-time faculty of 18, including several members from the audiology, dentistry and speech pathology professions.

The Department's main objective is to provide a high-level instructional program in otolaryngology and maxillofacial surgery for medical students and residents. To maintain a broad and in-depth teaching program, the Department's faculty and staff carries a large patient load in head and neck oncology, maxillofacial trauma, craniofacial defects (such as cleft palate), disorders of the vestibular mechanism, facial plastic surgery, pediatric and geriatric hearing problems, voice problems, peroral endoscopy, surgery of deafness, and all the areas usually considered otolaryngologic.

In addition to the major otolaryngology and maxillofacial medical-surgical service, there

are five other divisions in the Department which make this program comprehensive: craniofacial defects, otologic surgery of the head and neck, plastic and reconstructive surgery of the head and neck, research, and speech pathology and audiology.

Another major objective of the Department is to foster research programs designed to yield new knowledge in the field, and provide models for student and resident research training.

All senior faculty members participate in research and all residents are required, as part of the resident training program, to design, conduct and report on a research project during their program of study. In addition, there are several large-scale research programs within the Department in vestibular neurophysiology, cleft palate, and other craniofacial defects, nasophysiology, facial nerve conduction, microvascular reconstructive surgery, the effects of aging on hearing, anatomy of the temporal bone, neuroelectric audiometry, bone resorption in ear disease, and electrophysiology of the inner ear.

Several of these research programs receive federal and private financial support.

Graduate Course in Otolaryngology

The program in otolaryngology is in accordance with the requirements of the American Board of Otolaryngology. The program consists of a four-year course of basic and clinical science.

The basic science group consists of a series of didactic lectures and laboratory studies preparatory to actual clinical work. It is conducted during the first three and one-half months of residence, usually July 1 to October 15 of each year.

After passing an oral and/or written examination, the student enters the clinical phase of the course, which includes supervised clinical and operative work, clinical conferences, and seminars pertinent to the practice of otolaryngology and its related fields.

To complete the requirements for the Master of Science, the student must earn at least 30 semester hours of credit, one-third of which must come from the basic science group, and must present a thesis.

Students capable of additional work may also take elective courses.

A limited number of resident physicians can be accepted each year. Applicants must be graduates of a recognized class-A medical school and must have completed one year of general surgical training in an approved program.

Courses

68:3 Clinical Otolaryngology 2 s.h.

68:100 Clinical Internship in Otolaryngology arr.

68:101 Head and Neck Oncology arr.

68:102 Otology Course arr.

68:103 Physiology of Equilibrium arr.

68:104 Basic Principles of Facial Plastic and Reconstructive Surgery 4 s.h.

68:105 Special Clerkship in Otolaryngology 4 s.h.

68:199 Basic Otolaryngologic Science arr.
Special reference to head and neck, upper gastrointestinal tract, respiratory tract and ears, including lectures on descriptive anatomy and physiology, surgical anatomy of head and neck, embryology, microbiology, pathology, pharmacology, anesthesiology, allergy, oral surgery, radiology, speech pathology and audiology, psychology, scientific method (research and experimental methodology, design of experiments, and statistics); laboratory work includes head and neck dissection, histology of ear, and temporal bone surgery.

68:201 Research Techniques in Otolaryngology 3 s.h.
Laboratory course designed to familiarize student with research philosophy, equipment and procedures; required two months on full-time basis, with work in departmental research laboratories concerned with audiology, psychophysics, vestibular physiology, anatomy and physiology of larynx, microscopic anatomy and pathology of the temporal bone, and instrumentarium of biologic measurements; laboratory assignments supplemented with assigned readings and projects.

68:210 Clinical Conference in Otolaryngology, Rhinology, and Maxillofacial Surgery 1 s.h.
Presentation of diagnostic methods and outlines of management for assigned patients. May be repeated.

68:211 Clinical Otolaryngology, Rhinology, and Maxillofacial Surgery 3 s.h.
Diagnosis and treatment of patients in areas of rhinology, laryngology, otology, and maxillofacial surgery; systematic review and refinement of ENT examination techniques including endoscopy. May be repeated.

68:215 Histopathology 1 s.h.
Biweekly didactic seminar combining clinical case histories with temporal bone histopathology.

68:220 Basic Medical Audiometry 2 s.h.
Introduction to standard audiometric procedures.

68:221 Advanced Clinical-Audiology 2 s.h.
Special clinical tests of hearing, such as Bekesy Audiometry, PGSR, Delayed Feedback, SISI Test, SAL Test, tests of loudness recruitment, and other developments in audiometry.

68:230 Seminar: Medical Audiometry arr.
Critical review of audiometric procedures used in combination with medical procedures. May be repeated.

68:250 Seminar: Otolaryngology and Related Fields 1 s.h.
Critical and systematic review of current literature in otolaryngology and related fields. May be repeated.

68:300 Research: Otolaryngology arr.
Research completed in conjunction with thesis requirements for M.S. degree, involving preparation of prospectus which must be approved by faculty adviser and departmental research committee. May be repeated.

68:400 Dental Treatment of Maxillofacial Deformities 2 s.h.
Clinical orthodontics for patients with maxillofacial deformities. Limited to graduate students in dentistry.

68:401 Seminar: Maxillofacial Rehabilitation 1 s.h.
Weekly seminar discussing the entire field of facial deformities. Limited to medical and dental graduate students.

68:402 Fixed Prosthesis in Maxillofacial Rehabilitation arr.
Weekly seminar discussing the various types of fixed prosthetic appliances used in maxillofacial rehabilitation. Limited to graduate students in dentistry.

68:403 Restorative Dentistry in Maxillofacial Rehabilitation arr.
Weekly seminar discussing routine dental care in the maxillofacial patient and the differences in this care and that of the general population. Limited to graduate students in dentistry.

68:404 Dental Management in Irradiated Patients arr.
Weekly seminar discussing the diagnosis, treatment planning, radiation, and surgical treatment of the patient with head and neck cancer. Limited to graduate students in dentistry.

68:405 Seminar: Cleft Palate Rehabilitation 1 s.h.
Weekly seminar discussing the entire field of cleft lip and palate rehabilitation. This includes all the dental aspects of treatment, the surgical aspects of treatment, and an introduction to the speech problems of children with facial clefts. Limited to graduate students in dentistry.

68:430 Maxillofacial Prosthesis arr.
Clinical prosthetic treatment for patients requiring intra- or extraoral prosthesis, including facial and body prostheses. Limited to graduate students in prosthetic dentistry.

68:998 Special Studies on Campus arr.

68:999 Special Studies off Campus arr.

Pathology

Department head: George D. Penick
Faculty: *professors* Pasquale A. Cancilla, Thomas H. Kent, John A. Koepke, Edward S. Meek, George D. Penick, Earl F. Rose, Frederic W. Stamler
professor emeritus Emory D. Warner
associate professors Robert T. Cook, Fred R. Dick, Michael N. Hart, George F. Johnson, Franklin P. Koontz, Charles E. Pietz
assistant professors Carol A. Aschenbrener, Ronald D. Feld, James A. Goeken, George G. Klee, Frank A. Mitros, Donald P. Nicholson, Whyte G. Owen, Delane A.Wycoff
instructor William Allsbrook
associates Ruthanne Hyduke, James O'Connor, Marian Schwabbauer, Harvey M. Solomon, Frank Winkel
adjunct associates John Abadi, Earl Berglund
clinical associate professor Thomas E. Corcoran (VA Hospital, Des Moines)
clinical assistant professors Darryl L. Buck (Iowa Methodist Hospital, Des Moines), Douglas Schnetzler (Mercy Hospital, Iowa City)
clinical lecturer Kingsley B. Grant (St. Luke's Methodist Hospital, Cedar Rapids)
research scientists Lawrence DeBault, David L. Witte
Degree offered: M.S.

The Department offers basic courses in pathology to various health science students, a clinical training program in medical technology, a master's degree program, specialty training leading to certification in anatomic and clinical pathology by the American Board of Pathology, and a postdoctoral training program in clinical chemistry.

Clinical Training in Medical Technology

The Medical Technology Program at Iowa is sponsored through the cooperation of the College of Medicine, College of Liberal Arts, University of Iowa Hospitals and Clinics, and the Iowa City Veterans Administration Hospital. Satisfactory completion of this program qualifies the student for the Medical Technologists Board of Registry examination for designation as medical technologist (American Society of Clinical Pathologists). The program is approved by the Council on Medical Education of the American Medical Association and by the National Accrediting Agency for Clinical Laboratory Sciences.

The program comprises 12 consecutive months of didactic and practical instruction. The first six months are devoted to lectures, laboratory experience, demonstrations, and seminars covering theory and technique in clinical laboratory sicence. During the last six months, the student rotates through the clinical laboratory facilities of the University of Iowa Hospitals and Clinics and the Iowa City Veterans Administration Hospital, and attends additional lectures.

The program is limited to 32 students. A class of 16 students is admitted each July and January. Admission is on a competitive basis. Applications close December 31 for the classes beginning in July and August 31 for classes beginning in January.

Prerequisites for admission are the completion of:

94 semester hours of college study;
16 semester hours of chemistry, including qualitative analysis, quantitative analysis, organic chemistry, and biochemistry;
6 semester hours of mathematics, including a course in statistics; and
16 semester hours of biology including general zoology, microbiology, physiology, and parasitology.

General physics, biostatistics, and genetics are highly recommended.

Minimum cumulative grade-point averages of 2.0 overall and 2.5 in science are generally required (A=4).

An applicant who will enter the clinical training program before completing work toward a bachelor's degree must be able, by completing the clinical training program, to satisfy all University of Iowa requirements for the Bachelor of Science degree in general science.

An applicant who will enter the program as an undergraduate student must meet the general admission requirements of the University's College of Liberal Arts, and should consult with the University as early as possible to plan preclinical studies to meet all requirements.

Because the enrollment capacity of the clinical training program is limited, the University permits students completing preclinical studies at Iowa to satisfy degree requirements by completing clinical studies in other approved medical technology programs, with prior written approval from the College of Liberal Arts.

Graduate Program

The graduate program in pathology is sufficiently flexible to accommodate students with varied backgrounds. Students with B.S. degrees in chemistry, biochemistry, biology, zoology and medical technology, as well as medical and dental degrees, are encouraged to apply.

In addition to Graduate College requirements, the Pathology Department requires a 3.0 GPA in science courses and a combined verbal and quantitive GRE score above 1200. A personal interview is required before final acceptance into the program.

All programs involve components of teaching, patient care and research. These activities are structured in the teaching programs of the Department, the service laboratories of the Department and the University Hospitals, and the research laboratories of selected faculty members.

All degrees require a thesis.

Although the M.S. program is flexible and open to students with varied backgrounds, two structured degree programs are emphasized.

One track is designed to provide a research background for academically oriented resident physicians, or the occasional medical or dental student who may wish to pursue graduate training in pathology in conjunction with the professional school program.

The other track is especially appropriate for medical technologists to advance their training, usually by subspecialization in an area of laboratory medicine.

Special Programs

The Department is approved for 16 training positions in pathology, covering a training span of up to five years. The programs are designed to utilize the patient population of both University Hospitals and Clinics, and the Iowa City Veterans Administration Hospital.

There is systematic rotation through the various laboratory services, including surgical pathology, autopsy pathology, cytology, clinical biochemistry, medical microbiology, hematology and blood bank. Adequate opportunity is afforded for concentrated study in such subspecialities as neuropathology, dermatopathology, and gastrointestinal pathology, and special pathology of the head and neck region.

To provide these special experiences, the faculty includes members who have special interests in blood coagulation and its disorders, and diseases of the nervous system, gastrointestinal tract, skin, lungs, hematopoietic tissues, heart and blood vessels, as well as medical microbiology, clinical biochemistry, hematology and blood banking.

A postdoctoral training program in clinical biochemistry is offered. This program is approved by the American Board of Clinical Chemistry and is open to Ph.D. biochemists or chemists.

In addition, a limited number of externships and clerkships are available to predoctoral students.

Facilities

The Department has laboratories equipped for histopathology, histochemistry, electron microscopy, tissue culture, special chemistry, virology and blood coagulation, as well as the usual facilities for anatomic and clinical pathology. Our recently remodeled Pathology Learning Center has areas for seminars, independent study, multimedia learning activities and small group discussions.

Courses

69:1 Introduction to Medical Technology 1 s.h.
Survey of the role of medical technologists in various laboratory settings and their relationship to the health care delivery team. Open to students in allied health programs. Fall semester.

69:104 Principles of Human Pathology 1 s.h.
Course emphasizing terms, mechanisms and principles of disease and the ability to communicate these in simple terms. Open to graduate students in nutrition. Fall semester.

69:112 Medical Jurisprudence arr.
Lectures and discussions based on student research of medical-legal cases from Law Library or course syllabus; guest lectures involving law, business, insurance and office management. Medical and other students by arrangement. Fall semester.

69:121 Medical Technology I 3 s.h.
Theory and practice of analytical biochemistry applied to disease, states, including methodology, instrumentation, automation and reagent preparation; blood and pathology of blood-forming tissues; immunohematology; identification of pathogenic microorganisms. Medical Technology students only.

69:122 Medical Technology II 12 s.h.
Description same as for 69:121.

69:123 Medical Technology III 12 s.h.
Rotation through all sections of clinical pathology service laboratories; supervised acquisition of proficiency in the performance of laboratory procedures on patient specimens and organization of service laboratories. Medical Technology students only.

69:124 Medical Technology IV 3 s.h.
Description same as for 69:123.

69:130 Clinical Pathology for Physician's Assistant Students arr.
Theory and practice of selected clinical laboratory techniques and procedures, with emphasis on effective utilization of the clinical laboratory in the diagnosis and management of disease states.

69:201 General Pathology for Medical Students 5 s.h.
Detailed analysis of basic responses of body, causes of disease and pathogenic mechanisms of disease; introduction to use of laboratories in medicine; morphologic analysis of basic disease processes. First-year medical students and graduate students by arrangement. Spring.

69:202 Systemic Pathology for Medical Students 7 s.h.
Comprehensive analysis of human disease by organ systems and analysis of case problems utilizing morphology and clinical laboratory observations. Second-year medical students and graduate students by arrangement.

69:203 Principles of Human Pathology arr.
Course dealing with basic concepts of the principles of diseases. Recommended for health science students. Offered fall semester.

69:211 Research in Pathology arr.
Research supervised by faculty member relating to basic aspects of pathology or clinical patient material;emphasis on experimental design, methods, literature review and obtaining formal answers to a specific question. Medical students or graduate students by arrangement.

69:212 Graduate Instruction in Pathology arr.
Formal participation in teaching and evaluation of pathology courses. Medical students or graduate students by arrangement.

69:231 Special Topics in Pathology arr.
Individualized study of special topics in pathology as arranged with a faculty member. Medical students and graduate students by arrangement.

69:241 Clerkship in Pathology arr.
Active participation in one or more of the areas of pathology in work-up and interpretation of current clinical cases under resident and faculty supervision. Medical students and graduate students by arrangement.

69:999 Special Studies arr.
Individually arranged by student with approval of Department. Medical students.

Pediatrics

Department chair: Fred G. Smith, Jr.
Faculty: *professors* Thomas A. Anderson, George L. Baker, William E. Bell, Lloyd J. Filer, Samuel J. Fomon, James Hardy (Speech Pathology and Audiology), Victor V. Ionasescu, Ronald M. Lauer, John C. MacQueen, Charles H. Read, Robert J. Roberts (Pharmacology), Theodore D. Sculetis
professors emeriti Raymond R. Rembolt, Hans Zellweger
clinical professor Jack Spavak
clinical professor emeritus Lee Forrest Hill
associate professors H. Verdain Barnes (Internal Medicine), Allen Erenberg, Dennis C. Harper, Alfred Healy, Herman A. Hein, Thomas C. Kisker, Martin G. Myers, Jean E. Robillard, Richard M. Schieken, James A. Stehbens, Ronald G. Strauss, Robert G. Thompson, Miles M. Weinberger, M. Kabir Younoszai, Ekhard E. Ziegler
clinical associate professors Stephen C. Elliott, Alejandro M. O'Donnell
assistant professors Guy A. Carter, Enrique Chaves, Brenda Cruikshank, Dorothy A. Ehmke, Etekambe E. Ekwo, James W. Hanson, Charles S. Hayes, John T. Hayford, Nicholas Karagan, Vera Loening-Baucke, Lynn Lyon (Neurology), Gail A. McGuinness, Shivanand R. Patil, Lynn C. Richman, Raymond Tannous, Mark L. Wolraich
clinical assistant professors Kenneth W. Anderson, Robert W. Anderson, Siddiq M. Arab, William G. Bartlett, Barry S. Barudin, Carl E. Betts, James F. Boysen, George G. Caudill, B. Chandramouli, Mary P. Couchman, Hans C. Diriksen, Leonard G. Gangeness, Sixto F. Gulang, John C. Justin, Un Bong Lee, William C. McCormack, Everett A. Nitzke, John J. Polich, Maud H. Regne-Karlsson, William J. McAveney, Thomas G. Rosenberger, Stanley P. Taraska, Julianne H. Thomas, Alfonso Torres, Peter D. Wallace, Laverne Wintermeyer, James H. Ziska
clinical instructor Rizwan Z. Shah
associates Jon M. Fusselman, Mary H. Waziri, Mary Weinstein, Douglas N. Weismann

The Department of Pediatrics has designed its educational program to provide a solid foundation for the student and for those seeking postgraduate training. Extensive opportunities for general pediatrics and the subspecialties are available.

Affiliated programs in the Divisions of Maternal and Child Health, Iowa State Department of Health, State Services for Crippled Children, Hospital School for Handicapped Children, Blank Memorial Children's Hospital (Des Moines), the Davenport C & Y Program, and the Muscatine Community Health Clinic add depth to the educational program in community pediatrics and primary care.

The Department of Pediatrics is responsible for all facets of the pediatric section of the Sophomore Introduction to Clinical Medicine. Didactic lectures, simulated physical examination of the newborn and toddler provide the students with their initial pediatric patient contact. This includes history, physical signs, nutrition, appraisal of growth and development, and symptomatology of the newborn, toddler, and adolescent.

Inpatient service provides an opportunity for training in the complex problems of disease and critical illness. There are daily rounds involving general pediatrics and all subspecialties. Challenging and interesting cases are presented to the staff for discussion of diagnosis and treatment.

Outpatient experience stresses principles and practices required for the maintenance of health in children—immunizations, physical care, nutrition, mental hygiene, and utilization of public health facilities and referral agencies.

Graduate Program

The Department offers an approved three-year residency program of high quality which meets the requirements for Board eligibility in pediatrics.

Fellowships are available in all of the Board-approved subspecialties, as well as the major subdivisions of pediatrics. The programs are research and clinically oriented, encouraging development of knowledge and skill in the chosen discipline. Upon completion the candidates will have met the requirements for Board eligibility in the subspecialty.

Facilities

The Department of Pediatrics is located in the Univerisity of Iowa Hospitals, with inpatient and outpatient areas immediately adjacent to faculty offices, the Pediatric Library, and Cardiac Catheterization Laboratory.

The inpatient service is comprised of over 100 beds, and an excess of 19,000 patients are seen in the general, specialty, and continuing care clinics per year.

Laboratories performing both clinical and research studies are maintained within the Department.

Hospital School for Handicapped Children is

available for the child presenting with developmental disabilities, cerebral palsy, and mental retardation.

Courses

70:2 Clinical Pediatrics 6 s.h.
Principles and practices of health maintenance and treatment of acute and chronic illnesses in children; lectures, demonstrations, participation in patient care, daily rounds, ward work; emphasis on diagnosis and evaluation, nutrition, behavior problems, and survey of important disorders affecting children. For third-year medical students.

70:3 Introduction to Medical Genetics 2 s.h.

70:12 Nutrition, Growth Care and Developmental GI arr.
Four-week elective emphasizing clinical aspects of growth and pediatric nutrition, gastroenterology, and nephrology, including seminar program, clinical activities, approach to literature, research activities.

70:14 Community Pediatrics arr.
Exposure to private practice of pediatrics; student observes and participates with practicing pediatrician in daily office and hospital care of children.

70:15 Community Pediatrics: Iowa Methodist Hospital, Des Moines arr.
Work in community-based hospital; experience in care of patients as seen in daily practice and in special problems referred to children's hospital.

70:16 Pediatric Hematology arr.
Basic concepts of hematology and clinical approach to hematological problems and tumors seen in children.

70:17 Pediatric Neurology arr.
Close work with fellows and staff members, taking part in academic activities of this section, including departmental conferences.

70:18 Problems in Child Development arr.
Screening tests for developmental and emotional problems in children; resources available in Iowa communities for these problems.

70:19 Pediatric Cardiology arr.
Opportunity to participate in all clinical activities, observing cardiac catheterization and gaining some expertise in cardiac auscultation, ECG, and radiography; physical diagnosis and approach to heart disease and murmurs in pediatric subject emphasized.

70:23 Evaluation of Child Behavior arr.
Familiarization with evaluation techniques and management of children presenting behavioral problems.

70:24 Pediatric Endocrinology and Diabetes arr.
Familiarization with clinical aspects of endocrine disorders; intensive experience in management of childhood diabetes.

70:25 Developmental Disabilities arr.
Includes contact with outpatients and residential patients and their families; clinical evaluations, parent counseling, therapy regimens, and introduction to bracing the handicapped child.

70:27 Neonatal Intensive Care—4 West arr.
Student works as part of ward team in the Pediatric ICU with seriously ill infants; has direct responsibility for care under direct supervision.

70:28 Pediatrics Toddler Inpatient arr.
Student works as part of ward team in Toddler area; assigned case work-ups; has direct patient responsibility under supervision of resident and faculty staff; participates in conferences and gains skill in pediatric procedures.

70:29 Pediatrics Adolescence Inpatient arr.
Student works as part of ward team in Adolescent area; assigned case work-ups; has direct patient responsibility under supervision of resident and faculty staff; participates in conferences and gains skill in pediatric procedures.

70:30 Pediatric Genetics, Cytogenetics and Neuromuscular Disorders arr.
Student participates in all diagnostic and therapeutic problems presented; learns techniques of evaluating a genetic situation and counseling accordingly; participates in all section conferences.

70:31 Community Pediatrics arr.
Same description as for 70:14.

70:32 Pediatric Nephrology arr.
Supervised participation in renal clinic; inpatient service and outpatient consultations; student participates in all section conferences.

70:33 Pediatric Gastroenterology arr.
Four-week clinical program will emphasize gastrointestinal diseases in the pediatric age group.

70:34 Research in Gastroenterology arr.
Research in gastrointestinal growth and functional maturity using animal models.

70:35 Iowa Yucatan Senior Medical Student Exchange Program arr.

70:37 Pediatric Clinical Pharmacology and Toxicology arr.
Emphasizes basic skills and knowledge of therapeutics and pharmacological principles as related to drug use and action. Prior consent of instructor.

70:38 Community Pediatrics arr.
Offered only in winter months.

70:39 Pediatric Infectious Disease arr.
Increase basic skills and knowledge of the diagnosis and management of infectious diseases in children and diagnostic microbiology. Become familiar with microbiologic and pharmacologic principles related to antibiotic usage. Participate in investigational project. Prerequisite: consent of instructor.

70:40 Pediatric Endocrinology Research arr.
Increase understanding of current research projects and clinical research achieved through participation in clinics, educational activities, and one ongoing research project.

70:41 Pediatric Intensive Care — 1 West arr.
Increase skill and ability to care for critically ill infants and toddlers using life support systems.

70:42 Raymon Blank Memorial Hospital Neonatal Intensive Care Unit arr.
Opportunity to work in a 24-bed unit, well staffed and equipped Level II NICU.

70:43 Pediatric Allergy arr.
Exposure to ambulatory patients and inpatients, obtaining historical data for diagnosis. Perform and interpret pulmonary function tests, skin tests, learn appropriate management of diseases.

70:44 Research in Pediatric Infectious Disease 4 s.h.
Microbiologic and pharmacologic principles related to antibiotic usage; participation in an investigational project.

70:100 Practicum Pediatric Nurse Practitioners 3 s.h.

70:101 Child Health Care for Physician's Assistants arr.
Designed to acquaint the student with problems encountered in pediatric practice, with emphasis on preventive medicine; includes developmental landmarks, counseling of parents regarding nutrition, emotional problems, immunizations, discipline.

70:102 Pediatrics Elective for Physician's Assistant Students arr.

70:211 Nutrition of the Child 2 s.h.

70:555 Pediatrics for Physician's Assistant Students arr.

70:662 Medical and Pediatric Endocrinology arr.
Same as 78:662.

70:901 Office Practice of Pediatrics arr.
Students work with a pediatrician, obtain histories, and perform physical examinations and, with the pediatrician, decide on the proper course of diagnosis and management. Prior consent of instructor.

70:998 Special Studies on Campus arr.
Individually arranged electives must be submitted 60 days prior to beginning of rotation.

70:999 Special Studies off Campus arr.
Same description as for 70:998.

Pharmacology

Department head: J.P. Long
Faculty: *professors* Michael Brody, Lawrence Fischer, John Long, Robert Roberts, James Spratt, William Steele, Thomas Tephly, Lucas Van Orden, Harold Williamson *professor emeritus* Erwin Gross *associate professors* John Ambre, Anne Autor, Jeffrey Baron, Ranbir Bhatnagar, Gerald Gebhart, Kent Hermsmeyer, Thomas Shires, Miles Weinberger
Degrees offered: M.S., Ph.D.

The Department is involved in the professional education of health science students. A recognized graduate program with a full series of courses has been developed. Clinical pharmacology and clinical toxicology also receive emphasis.

Extensive research and training programs in the Department include biochemical pharmacology and toxicology, drug metabolism, central nervous system and autonomic pharmacology, and the pharmacology of the cardiovascular and renal systems. There are several significant interactions with other departments, such as the Neurobehavioral Studies Program and the Cardiovascular Program Project of the Department of Internal Medicine. A considerable portion of the Department of Pharmacology consists of the Center for Biochemical Pharmacology and Toxicology. Research training in all areas of pharmacology and toxicology is available at the predoctoral and postdoctoral levels. This training is in preparation for the extensive career opportunities available in academic teaching and research in various types of institutional research laboratories and in industrial research.

Graduate Study

Prerequisites for graduate study include undergraduate background in chemistry, biology and mathematics, and a high level of past performance is expected of all applicants.

M.S. Program

In cooperation with clinical departments within the College of Medicine, a Master of Science degree program in clinical pharmacology is available to applicants who already hold the Doctor of Medicine degree. The specific objective of these programs is to provide increased emphasis on, and training in, the science of clinical pharmacology for residents in the various clinical specialties.

Completion of the program requires a minimum of two full years. The following core curriculum is mandatory unless specifically waived by the Pharmacology faculty:

63:167 Biometrics and Bioassay
71:206 Biochemical Pharmacology
71:100 Chemobiodynamics

71:103 Pharmacology and Toxicology
or
71:216 Clinical Toxicology

71:204 Pharmacology Seminar
71:203 Pharmacology Research
71:210 Special Topics in Pharmacology
71:105 Pharmacology for Health Sciences (Medical)(audit)

Additional courses may be taken as appropriate to the progress of the trainee.

At the completion of the final year, the candidate will be eligible for a Master of Science degree in pharmacology provided he or she has demonstrated sufficient proficiency in basic research, has passed the qualifying examination (written and oral) and has satisfied the thesis requirements (preparation and defense).

Ph.D. Program

Graduate students are expected to be prepared for the written and oral qualifying examinations for the Doctor of Philosophy degree at the end of two and one-half years of study, after completion of these required courses:

71:100 Chemobiodynamics
99:120 The Chemistry of Biological Materials
and/or
99:130 Metabolism

72:110 Neurobiology and Behavior
72:212 Medical Physiology
72:118 Endocrinology for Medical Students
71:101 Pharmacology for Health Sciences (Pharmacy)
63:167 Biometrics and Bioassay
71:103 Pharmacology and Toxicology
71:206 Biochemical Pharmacology
71:203 Pharmacology Research
71:204 Pharmacology Seminar
71:207 Pharmacology of Excitable Cells
One or more graduate biochemistry course(s)

The student must complete at least one course, appropriate to his or her interest, beyond those listed above, and more than one may be required by individual faculty research advisers.

There is no departmental foreign language requirement.

Sometime during the first graduate year the student selects a faculty research adviser. Students are encouraged to obtain a maximum of laboratory research experience during the first two years. After successful completion of the Ph.D. comprehensive exam, usually at the end of two and one-half years, the student embarks on or continues his or her Ph.D. thesis research. Thesis research usually requires two years beyond the comprehensive examination.

The Doctor of Philosophy degree is awarded upon satisfactory preparation and defense of the thesis in an oral examination.

Departmental Financial Aids

Training grants are available for graduate and postdoctoral students.

Courses

71:100 Chemobiodynamics 1 s.h.
Philosophical and experimental approaches to drug research; emphasis on concepts and tools of biological research; chemobiodynamics and receptor theory included. Fall. Prerequisite: consent of instructor.

71:101 Pharmacology for Health Sciences (Pharmacy) 5 s.h.
Lecture course; general principles of pharmacology, pharmacologic actions of drugs and correlation with therapeutic uses. Open to students in pharmacy and qualified graduate students,the latter by consent of course director. Fall. Prerequisite: 72:150 and 99:162 or equivalent courses and consent of instructor.

71:103 Pharmacology and Toxicology 3 s.h.
Continuation of 71:101; lecture-discussion; emphasis on the toxicology of drugs and environmental chemicals. Open to students in pharmacy and to qualified graduate students, the latter by consent of course director. Spring. Prerequisites: 71:101 or equivalent.

71:105 Pharmacology for Health Sciences (Medical) 5 s.h.
Lecture course; general principles of pharmacology, pharmacologic actions of drugs and correlation with therapeutic uses. Fall. Prerequisites: 72:152 and 99:161 or equivalent courses, and consent of instructor.

71:111 Pharmacology for Health Sciences (Dental) 5 s.h.
Lecture course; general principles of pharmacology, pharmacologic actions of drugs and correlation with therapeutic uses. Spring. Prerequisites: 72:152 and 99:161 or equivalent courses with consent of instructor.

71:120 Drugs: Their Nature, Action and Use 0-2 s.h.
Lecture-discussion; principles of drug action and drug toxicity; specific classes of drugs covered include antibiotics, oral contraceptives, sedatives, stimulants, hallucinogens, narcotics and others. Open to all students. Spring. No prerequisites.

71:125 Pharmacology for Health Sciences (Physician's Assistant Students) 5 s.h.
Lectures and discussions; general principles of pharmacology, pharmacologic actions of drugs and correlation with therapeutic uses. Fall. Prerequisites: 99:164 and 72:150 or equivalent courses with consent of instructor.

71:130 Intermediate Pharmacology 2 s.h.
Designed to acquaint students in health professions with fundamental principles of pharmacology at the intermediate level; various classes of drugs are discussed with regard to action, absorption, disposition, metabolism, excretion and toxicity; agents used by dental profession are emphasized. Spring. Prerequisite: undergraduate level biochemistry and physiology.

71:202 Muscle Pharmacology 1 s.h.
Basis for actions of drugs on muscle cells, emphasizing alterations in the mechanisms underlying excitation and contraction; special emphasis on cardiac and vascular muscle; assumes a knowledge of muscle physiology. Fall. Prerequisite: graduate or medical courses in physiology and pharmacology, and consent of instructor.

71:203 Pharmacology Research arr.
Prerequisite: consent of Department head.

71:204 Pharmacology Seminar 1 s.h.
Prerequisite: consent of Department head.

71:205 Advanced Cardiovascular Pharmacology and Physiology 2 s.h.
Recent developments in cardiovascular pharmacology, physiology and pathophysiology of cardiovascular disease. Fall, odd years. Prerequisite: consent of instructor. Same as 72:271.

71:206 Biochemical Pharmacology 3 s.h.
Basis for drug effects on the molecular and biochemical systems of the cell and actions of these systems on drug molecules; specific considerations include membrane functions, protein and nucleic acid synthesis, intermediary metabolism, pharmacokinetics, drug metabolism, and enzyme induction and turnover. A strong background in biochemistry and pharmacology is recommended. Fall, odd years. Prerequisite: consent of instructor.

71:207 Pharmacology of Excitable Cells 2 s.h.
Pharmacological mechanisms by which neuroeffector function can be modified, including actions on cell ultrastructure, membrane excitability, neurotransmitter

synthesis and degradation and integrated neuronal activity; intended for students who contemplate research and teaching in neuropharmacology. Fall. Prerequisite: neurobiology and consent of instructor.

71:210 Special Topics in Pharmacology arr.
Prerequisite: consent of Department head.

71:212 Toxicology 2 s.h.
For pharmacology graduate students and other interested students; selected topics in pharmacologic toxicology are presented; emphasis on drug-induced injury, mechanisms of toxicity, prenatal and neonatal toxicity, drug safety evaluation; forensic and environmental toxicology are also considered. Spring, odd years. Prerequisite: 71:101 or equivalent by consent of course director.

71:213 Advanced Neuropharmacology 3 s.h.
Lectures on biochemistry and structure of the vertebrate nervous system as related to the actions of drugs; behavioral and physiologic correlates of specific drug actions; special topics of central nervous system research of current interest. Spring, odd years. Prerequisite: consent of instructor. Same as 31:231.

71:214 Renal Pharmacology 1 s.h.
Mechanisms of action of drugs affecting renal transport systems. Fall, odd years. Prerequisites: introductory courses in physiology and pharmacology and consent of instructor.

71:216 Clinical Toxicology 1 s.h.
Toxicological implications of drugs and chemicals for the practicing physician; topics include recognition and treatment of accidental and intentional intoxication (overdose); discussion will include: salicylates, sedative hypnotics, heavy metals, household products, pesticides, food poisoning and drugs of abuse. Fall. Prerequisite: 71:105 or equivalent.

71:272 Seminar in Cellular and Molecular Biology 1 s.h.
Research report by students and faculty, with occasional visits from external speakers; topics include information transfer and regulation, assembly and developmental processes, membranes and transport. For students in cellular and molecular biology research training program and others interested, with consent of the instructor. May be repeated for credit. Same as 60:272, 61:272, 37:272, 72:272, 99:272.

71:284 Advanced Techniques in the Neurosciences 1 s.h.
Same as 31:284, 37:284, 60:284, 72:284, 99:284.

71:380 Clinical Pharmacology and Therapeutics Lecture Series 2 s.h.
Series of lectures by clinicians and pharmacologists covering therapeutics; special emphasis on rational pharmacologic approaches to treatment of disease in human. Open to fourth-year medical students. Spring. Same as 78:380.

Physical Therapy

Program director: Gary L. Smidt
Associate director: Gary L. Soderberg
Faculty: *professor* Gary Smidt
assistant professors Louis Amundsen, Leo Morrissey, David Nielsen, Gary Soderberg, Nancy Urbscheit
adjunct assistant professor Jasbir Arora
assistant professor emeritus Olive Farr
associates Byron Bork, William Dostal, Varick Olson
Advisory committee: Reginald Cooper (Orthopaedics), chair; Alfred Healy (Pediatrics), Fred Lineer (Hospital Administration), Rex Montgomery (College of Medicine), Gary Smidt (Physical Therapy), George Soper (Physical Therapy), Robert Tomanek (Anatomy), graduate student representative, certificate student representative
Degrees offered: professional certification, M.A., Ph.D. (in Physical Education)

Physical therapy offers a wide variety of opportunities for professional practice in general or specialized hospitals, programs for crippled children, physicians' offices and physical therapy clinics, extended care facilities, nursing homes, community and governmental agencies, rehabilitation centers, the armed forces, foreign service and athletic departments. Additional career opportunities are available for teaching in educational programs of physical therapy and related professions.

Physical therapists participate in the evaluation of the capabilities and disabilities of patients. They administer treatment to alleviate pain, correct or minimize deformity and improve the general health status of the individual, and they teach the patient, the patient's family or other personnel the appropriate procedures for the patient's continuing care. They are also involved in the administration of physical therapy facilities, the supervision of supportive personnel and consultation with other health professionals.

Professional Program

The physical therapy program at The University of Iowa is fully accredited by the American Physical Therapy Association and the Council on Medical Education of the American Medical Association. Satisfactory completion of the curriculum qualifies candidates for the Professional Examination Service (P.E.S.) test for licensure in Iowa and most other states.

The two-year professional certification program consists of:

Semester I

60:108 Human Anatomy	4 s.h.
101:115 Kinesiology	3 s.h.
101:131 Therapeutic Physical Agents	arr.
101:141 Introduction to Physical Therapy	arr.
69:203 Principles of Human pathology	2 s.h.
63:161 Introduction to Biostatistics	3 s.h.

Semester II

60:109 Human Anatomy and Neuroanatomy	4 s.h.
72:150 Intermediate Physiology	4 s.h.
101:110 Therapeutic Exercise I	arr.
101:118 Clinical Observation	arr.
101:122 Emotional Aspects of Disability	2 s.h.
101:190 Electrotherapy	arr.

Semester III

101:101 Introduction to Clinical Medicine and Clinical Sciences	arr.
101:102 Fundamentals of Orthopaedics and Clinical Sciences	arr.
101:111 Therapeutic Exercise II	4 s.h.
101:113 Principles of Neurology and Clinical Sciences	2 s.h.
101:119 Clinical Education and Rehabilitation	arr.
101:103 Scientific Inquiry	1 s.h.
101:121 Physical Therapy Administration	1 s.h.
101:116 Radiology for Physical Therapists	arr.

Semester IV

101:120 Clinical Internship	arr.

Admission to the Professional Program

A new class is admitted each fall. Students may enter the program either following their junior year of college or after earning a baccalaureate degree. A student entering the program after his or her junior year of undergraduate study must be able to satisfy all requirements for the Bachelor of Science degree in general science by successfully completing the first year of the physical therapy program.

Undergraduate students who complete their preprofessional work at other colleges or universities must meet the general admission and graduation requirements of the University of Iowa College of Liberal Arts; they should consult with the University to plan their preprofessional studies to meet the requirements of the physical therapy program.

Regardless of academic preparation prior to admission, all students are enrolled in the same two-year professional curriculum

leading to certification in physical therapy. To be considered for admission, the applicant should have: completed at least 94 semester hours of college study, including a complete introductory course and one advanced course in biology (12 s.h.), a complete introductory course in chemistry (8 s.h.), a complete introductory course in physics (8 s.h.), a complete introductory course in psychology (6 s.h.) and one college-level mathematics course (3 s.h.). All science courses must have been completed in the major department offering the course, and must include at least one-fourth laboratory instruction. The applicant should have a minimum overall grade-point average of 2.7 (A=4), and a 3.0 minimum in all courses in biology, chemistry, physics and psychology.

Graduate applicants must take the national Graduate Record Examination prior to admission. Undergraduates must take the GRE during the first year of professional training. Results of this examination must be mailed to The University of Iowa.

Applications must be made to the Director of Admissions, The University of Iowa. Personal interviews may be required. Applicants will be contacted for appointment if interviews are desired. The Physical Therapy admissions committee selects the applicants who appear to be best qualified for the study and practice of the profession.

Applications are accepted beginning September 1 for the following year. Prospective students are urged to apply as early as possible. The closing date is February 1.

Master of Arts

The purpose of the Master of Arts degree program in Physical Therapy is to provide opportunities for advanced learning experiences, primarily in research and teaching. Biological, mechanical and psychological bases and associated applications to physical therapy (prevention, evaluation and treatment) are emphasized for movement disorders of the musculoskeletal, neuromuscular and cardiopulmonary areas. The program is sufficiently flexible to accommodate elective pursuits commensurate with the student's ability and interest.

Program Requirements

The program requires 30 semester hours of graduate work beyond the professional certification. A thesis is required.

Required Courses

101:301 Thesis: Physical Therapy	4 s.h.
101:212 Medical Instrumentation	3 s.h.
63:167 Biometrics and Bioassay	3 s.h.
101:213 Principles of Human Motion I	3 s.h.
101:260 Cardiopulmonary Therapeutics	3 s.h.
101:275 Evaluation of Selected Neurological Disorders	3 s.h.
101:280 Practicum: Teaching Methods and Design	3 s.h.
and/or	
101:282 Clinical Educational Practicum	3 s.h.
and/or	
101:284 Practicum in Research	3 s.h.
101:220 Seminar Physical Therapy	1 s.h.
101:326 Analysis of Scientific Literature	2 s.h.

Recommended Courses

101:325 Independent Study	arr.
27:153 Advanced Anatomy and Kinesiology	2-4 s.h.
69:203 Principles of Human Pathology	arr.
101:295 Electromyography in Kinesiology and Biomechanics	3 s.h.
7H:262 Facilitation of Learning in Health Science Education	3 s.h.
7P:248 Data Processing	3 s.h.
7P:150 Educational Measurement for the Classroom Teacher	2-3 s.h.
63:171 Problems in Preventive Medicine	arr.
27:257 Biomechanics of Human Motion	4 s.h.
27:312 Selected Issues in Information Processing and in Motor Control	3 s.h.
31:123 Psychology of Learning	3 s.h.
101:290 Advanced Electrotherapy and Electrodiagnosis	2 s.h.
71:120 Drugs, Their Nature, Action, and Use	0-2 s.h.
101:116 Radiology for Physical Therapists	arr.
101:325 Independent Study	arr.
101:327 Research in Therapeutics	arr.

Elective Courses

Students are encouraged to seek out appropriate elective courses.

Facilities

Personnel associated with the program have access to the physical therapy and orthopaedic-biomechanics laboratories, and to the biomechanics laboratory in the College of Engineering. These laboratories are equipped with instrumentation — computers, oscilloscopes, electromyographs, electrogoniometers, force plate, high-speed cameras, motion analyzer, accelerometers, force table, O_2 and CO_2 analysis, bicycle ergometer, treadmill— needed to solve movement problems associated with the human in the normal and abnormal states.

The master's degree program in physical therapy is an integral part of collaborative studies of medical problems with orthopaedics, engineering, neurology, cardiology, physiology, anatomy, and pediatrics; the master's degree program and the Physical Therapy Clinic interrelate in terms of conferences, teaching, patient care and research.

Financial Support

The program strives to provide financial assistance for all full-time students.

Admission

To be considered for admission to the master's degree program, the applicant must be a graduate of an approved professional program of physical therapy, meet the admission requirements of the University of Iowa Graduate College, and pass the professional licensure examination for physical therapists. Clinical experience is desirable.

Deadlines for written applications are February 15 and May 15.

Doctor of Philosophy Program

The physical therapy program coordinates a Ph.D. program for physical therapists. Prerequisites to the program are calculus, licensure as a physical therapist, and a master's degree. The purpose of the program is similar to the master's degree program except that greater breadth and depth in research and teaching capabilities are emphasized for one area of physical therapy specialization—musculo-

skeletal, neuromuscular, or cardiopulmonary. The program emanates from the Department of Physical Education—Field House (see College of Liberal Arts).

The program is designed to produce professionals with advanced training for positions of leadership in physical therapy including graduate and professional educational programs in physical therapy.

Courses

(May be taken only by students in the professional program.)

101:101 Introduction to Clinical Medicine and Clinical Sciences arr.
Lectures, demonstrations, case presentations of medical disorders from standpoint of etiology, clinical signs and symptoms, treatment and prognosis.

101:102 Fundamentals of Orthopaedics and Clinical Sciences arr.
Lectures, demonstrations and case presentations of orthopaedic disorders from standpoint of etiology, clinical signs and symptoms, treatment and prognosis.

101:103 Scientific Inquiry 1 s.h.
Formal lectures and reading assignments define and reinforce concepts of the scientific method; students write and present a paper which defines a physical therapy-related problem; evaluation of relevant studies and suggestions for a solution to the investigative problem.

101:110 Therapeutic Exercise I arr.
Principles and techniques of therapeutic exercise related to prevention, correction, alleviation of disease and injury; includes posture, posture evaluation, exercises, test and measurements, joint range of motion, gait analysis and functional activities.

101:111 Therapeutic Exercise II 4 s.h.
Lectures, demonstrations, case presentations in principles and techniques of therapeutic methods relative to muscle reeducation, neuromuscular facilitation, amputees and orthotics. Continuation of 101:110 which is prerequisite.

101:113 Principles of Neurology and Clinical Sciences 2 s.h.
Lectures, demonstrations and case presentation of neurologic disorders treated by therapists.

101:115 Kinesiology 3 s.h.
Study of selected anatomical, structural and functional properties of human connective, muscular and nervous tissues and skeletal structure; mechanical, neuroregulatory and muscular influences upon normal and pathological motion; technique, validity and reliability of methods of evaluation of a variety of musculoskeletal, neurological and cardiopulmonary pathologies.

101:116 Radiology for Physical Therapists arr.
Ten-lecture course in basic radiographic interpretation for physical therapy students; students have opportunity to observe specialized radiography techniques and beginning interpretation of radiographs in class.

101:118 Clinical Observation arr.
Practice of physical therapy procedures in hospital physical therapy departments under supervision of qualified physical therapists.

101:119 Clinical Education and Rehabilitation arr.
Presents units involving consideration of the total patient care concept. Continuation of 101:118 which is prerequisite.

101:120 Clinical Internship arr.
18 weeks of full-time clinical experience, emphasizing independent evaluation, planning and treatment implementation.

101:121 Physical Therapy Administration arr.

101:122 Emotional Aspects of Disability 2 s.h.
Explores emotional problems related to physical disability and overview of psychopathology. Prerequisite: 6 s.h. psychology.

101:125 Counseling for Health Professions arr.
Introductory course in basic counseling theories and techniques appropriate to the health professional or health science student; emphasis on integrating helping skills and developing personal styles.

101:131 Therapeutic Physical Agents arr.
Theory, physiological effects and techniques of scientific massage as it is used in all aspects of physical therapy discussed and applied; hydrotherapy practiced and discussed; physics of water reviewed; techniques of whirlpool, hot and cold applications, underwater exercises in relation to various physical disabilities.

101:141 Introduction to Physical Therapy arr.
Lectures and discussions related to physical therapy and other allied health professions; professional ethics and responsibility of the individual to the profession and society.

101:190 Electrotherapy arr.
Descriptive medical electronics and instrumentation; application of principles, methods and techniques in diagnosis and therapeutic use of medical electricity; laboratory demonstrations and assignments to develop the techniques of application.

101:212 Medical Instrumentation arr.
Basic concepts in electronics and application of these concepts to physical therapy research and practice.

101:213 Principles of Human Motion I arr.
Mechanical and physiological principles applied to study of human movement; emphasis on exercise, posture, locomotion. Laboratories included.

101:214 Principles of Human Motion II arr.
Current status of research for biological, mechanical and psychological components pertinent to musculoskeletal, neuromuscular and cardiopulmonary areas of physical therapy. Summers, odd years.

101:220 Seminar Physical Therapy arr.
Basic and clinical studies directly related to physical therapy will be presented and discussed, highest priority to studies proposed, in process, or completed by physical therapy students and staff.

101:260 Cardiopulmonary Therapeutics arr.
Physiological cardiopulmonary adaptive mechanisms and limitations in the ability to perform and sustain physical activity in health and disease; clinical and laboratory methods for observing the magnitude and degree of pulmonary stress. Laboratory included.

101:275 Evaluation of Selected Neurological Disorders arr.
Identification, description and discussion of physiological mechanisms underlying specific movement disorders caused by neurological lesions, and the implementation of these mechanisms to the practice of physical therapy. Laboratories included.

101:280 Practicum: Teaching Methods and Design arr.
Individual instruction, observation and experimentation in teaching, guidance and analysis of evaluation processes.

101:281 Teaching Practicum arr.

101:282 Clinical Educational Practicum arr.
Clinical physical therapy practice, usually in the student's area of concentration; designed to provide opportunity for application of newly-acquired knowledge and skill in a clinical setting.

101:283 Clinical Educational Practicum 1 s.h.

101:284 Practicum in Research arr.
Orientation to ongoing physical therapy and related research projects; practical experiences in data collection and research-related activities.

101:285 Practicum in Research arr.

101:290 Advanced Electrotherapy and Electrodiagns arr.
Study of electronic methods used for treatment and diagnosis of neuromuscular disorders; special emphasis on electromyography. Offered spring of odd-numbered years.

101:295 Electromyography in Kinesiology and Biomechanics 3 s.h.
Electromygraphic recording instruments and techniques commonly used in kinesiologic and biomechanical studies are emphasized. Intramuscular and surface EMGs are laboratory performed, compared and evaluated relative to variables such as muscle length, tension and type of contraction. Use of the EMG in motor unit training, biofeedback and myoelectrics is included. Same as 27:295.

101:301 Thesis: Physical Therapy arr.
Serves to guide and instruct students in all facets relating to thesis; formulation of problem, literature search, procedure for collecting data, analysis of data, organization of thesis and writing thesis.

101:325 Independent Study arr.
Problem-solving experience related to physical therapy; commensurate with student's interest and ability.

101:326 Analysis of Scientific Literature arr.
Seminar geared to develop student's ability to critically evaluate experimental research, knowledge in selected areas and verbal skills, plus ability to lead and interact within group situation.

101:327 Research in Therapeutics arr.
Individual student effort to place some phase of physical therapy on a sound scientific base and initiate, refine, or establish methods included in evaluation and treatment; may be accomplished by direct clinical and laboratory means or via a philosophical treatise.

Physician's Assistant Program

Program director: Denis Oliver
Degree offered: B.S.

The physician's assistant is a person qualified to collect historical and physical data about a medical patient, organize and present this data in such a way that the supervising physician can visualize the medical problem, and assist the physician in determining appropriate diagnostic or therapeutic procedures. The physician's assistant is also capable of performing these procedures, and of coordinating the activities of other, more technical, assistants. While the physician's assistant functions under the general supervision and responsibility of the physician, under certain circumstances, and

under defined rules, the physician's assistant may perform without a physician's surveillance, and thus must be able to exercise independent judgement based on general medical knowledge. The demand for physician's assistants is increasing in all types of health care settings, particulary as the role becomes more clearly defined.

The Iowa Program

The program at Iowa is approved by the American Medical Association's Joint Review Committee on Educational Programs for the Assistant to the Primary Care Physician, the Iowa Board of Medical Examiners and the Association of Physician's Assistant Programs. Completion of the program qualifies students for the Bachelor of Science degree and to sit for the National Certifying Examination for Primary Care Physician's Assistants. Successful completion of the National Certifying Examination is a prerequisite to registration at Iowa.

The program at The University of Iowa emphasizes the practice of general medicine in a setting designed to foster the use of health care teams. In addition to opportunities with private practicing physicians, a network of primary care clinics is being developed in the state to serve communities with an integrated health care system. These family clinics will integrate the physician's assistant into the medical delivery team with physicians, health technicians, public health nurses, clinical nursing staff, and social service personnel.

The Physician's Assistant Program is an integral part of the College of Medicine. The first year of the Program is taken at the University of Iowa Health Center. A major portion of the second-year clinical work occurs throughout the state in settings where primary care is practiced.

The Program is 24 months in length and is broadly divided into three phases. The initial, didactic, phase consists of seven months of course and laboratory work in a number of basic science areas. Whenever appropriate, related subjects are integrated to provide sequential lecture, laboratory and clinical experience. A seminar course specifically directed to the history and development of the physician's assistant profession is also offered during this session.

The second phase, Introduction to Clinical Medicine for Physician's Assistant Students, is an informational bridge to clinical medicine, and develops the skills of history-taking, physical diagnosis and interviewing techniques.

The third, clinical, phase consists of supervised rotations in required and elective specialties. These rotations of two, four, or six weeks' duration allow the students to apply the knowledge gained in the didactic and preclinical phase of the program and to develop additional skills through individual, supervised instruction. The rotations are designed to prpvide opportunities for each student to become proficient in the history-taking and physical examinations on patients with various conditions. Inpatient clinical training is provided by the University of Iowa Medical Center and affiliated hospitals, as well as the model health care clinics at Muscatine, Davenport, Mason City, and Des Moines. Students gain additional clinical experience through placement with selected preceptors involved in clinical work in private practice or in community hospitals.

The didactic and clinical phases of the program emphasize primary health care delivery and the use of physician's assistants on this type of service team. The program is integrated into the teaching of the College of Medicine, thus permitting a symbiosis to develop between various medical and health care professional students.

Professional Curriculum

First Year

71:125 Pharmacology for Health Sciences: Physician's Assistant	5 s.h.
50:105 Law and Medicine for Physician's Assistant Students	1 s.h.
60:111 Gross Human Anatomy for Physician's Assistant Students	6 s.h.
61:110 Microbiology for Physician's Assistant Students	2 s.h.
69:203 Principles of Human Pathology	4 s.h.
69:130 Clinical Pathology for Physician's Assistant Students	2 s.h.
72:164 Human Physiology for Physician's Assistant Students	4 s.h.
99:164 Biochemistry for Physician's Assistant Students	3 s.h.
117:101 Seminar for Physician's Assistant Students	2 s.h.
50:121 Introduction to Clinical Medicine for Physician's Assistant Students	20 s.h.

Second Year

Required clinical rotations:

70:555 Pediatrics for Physician's Assistant Students	6 s.h.
75:555 General Surgery for Physician's Assistant Students	6 s.h.
78:555 Internal Medicine for Physician's Assistant Students	6 s.h.
115:555 Family Practice I for Physician's Assistant Students	6 s.h.
115:556 Family Practice II for Physician's Assistant Students	6 s.h.
66:100 Obstetrics and Gynecology for Physician's Assistant Students	6 s.h.
73:100 Psychiatry for Physician's Assistant Students	4 s.h.

Elective clinical rotations, selected from the following:

70:102 Pediatrics Elective for Physician's Assistant Students	arr.
75:100 Emergency Room for Physician's Assistant Students	arr.
76:102 Orthopaedics for the Physician's Assistant Students	arr.
115:500 Family Practice Elective for Physician's Assistant Students	arr.
78:100 Internal Medicine Elective for Physician's Assistant Students	arr.
62:5 Dermatology for Physician's Assistant Students	arr.
74:5 Radiology for Physician's Assistant Students	arr.
75:110 Surgery Elective for Physician's Assistant Students	arr.
76:105 Rehabilitation Elective for Physician's Assistant Students	arr.
79:120 Urology Elective for Physician's Assistant Students	arr.

Faculty

All courses in the physician's assistant professional program are taught by College of Medicine departmental faculty members. The program is administered with advisory assistance from a committee appointed by the dean of the College and includes medical faculty members, practicing physicians in private practice, health care administrative personnel and students currently enrolled in the Program.

Expenses

In addition to tuition, room, board, books, supplies and other general University student expenses, students in the physician's assistant program are responsible for the purchase of their uniforms and diagnostic equipment. Microscopes are not required.

Admission

Requirements

To be eligible for admission to the physician's assistant program, the applicant must have completed 60 semester hours of college study, including:

College of Liberal Arts general education requirements in rhetoric, physical education, and the historical-cultural, literature and social science cores;

A complete introductory course in inorganic and organic chemistry; and

A complete introductory and at least one advanced course in zoology or animal biology.

It is also strongly recommended, although not required, that the applicant's high school background include algebra, trigonometry and physics.

Applicants who have already completed an associate of arts or a baccalaureate program at an accredited college or university automatically meet the Liberal Arts general education requirements.

The applicant must have achieved at least a 2.5 grade-point average (A=4) on the last 60 semester hours of college coursework undertaken. The admissions committee gives special attention to the applicant's performance in science courses.

Satisfaction of the basic admission requirements does not ensure acceptance into the Physician's Assistant Program. The admissions committee selects the applicants it considers best qualified. Applicants with previous health care experience involving direct patient contact receive preferential considerations. The committee may request interviews with selected applicants.

Admission Procedures

A new class begins each June. Applications are accepted beginning one year in advance, and close January 15. Each applicant must complete the Physician's Assistant Program supplementary application and submit at least three letters of recommendation.

Course

117:101 Seminar for Physician's Assistant Students 0-3 s.h.
Lectures, readings and group sessions dealing with the history and development of physician's assistant profession. Open only to students in the physician's assistant program.

Physiology and Biophysics

Department head: R.E. Fellows
Faculty: *professors* Francois M. Abboud (Internal Medicine), Robert E. Fellows, G. Edgar Folk, Jr., Nicholas Halmi (Anatomy), C. Adrian Hogben, M. Ian Phillips, Byron Schottelius, Harold Shipton, Charles Tipton (Physical Education), Charles Wunder
associate professors Carl Gisolfi (Physical Education), Charles Imig, David Reynolds (Surgery), Gordon Searle, John D. Thomson
assistant professors Kurt Beam, David Dawson, Felix Grissom, Ronald Joyner, Richard Maurer
Degrees offered: M.S., Ph.D.

The Department offers a program of graduate study leading to the Doctor of Philosophy degree. This program requires four or more years for completion. In addition, a two-year program leading to the Master of Science degree with thesis is available. The Department participates in the Medical Scientist Training Program (combined M.D.- Ph.D. program) conducted under the auspices of the Graduate College and the College of Medicine. It also takes part in the professional education of medical, dental, pharmacy, physical therapy, nursing, and physician's assistant students.

Graduate Study

The graduate program of the Department is designed to provide fundamental knowledge of life processes at cellular and organ levels as well as an opportunity for advanced study in major areas of physiology and biophysics. The program places strong emphasis on the development of modern research skills and their application in the conduct of original research.

The beginning student is guided and advised by the director of graduate studies, who assists in planning a program of formal courses and graded research experience for the first two years. In addition to coursework in advanced general physiology and biophysics, specialized formal study is offered in membrane, cardiovascular, endocrine, muscle, respiratory, gastrointestinal, renal, environmental, and exercise physiology, neurobiology, and bioinstrumentation. The student also may elect courses in other departments.

Upon completion of the required advanced coursework and acceptable performance on a comprehensive examination in physiology and related areas—usually after two years of study—the student devotes full time to original research. This culminates in the writing of a dissertation embodying a significant contribution to scientific knowledge and the defense of the dissertation in a final oral examination.

All degree candidates are expected to have supervised experiences as classroom instructors and research assistants as part of their training.

Financial Aid

Full-time graduate students in the doctoral program are usually awarded financial aid, with continued support contingent upon satisfactory progress and the availability of funds.

Facilities

The Department of Physiology and Biophysics occupies two floors devoted to research and teaching in the Basic Sciences Building, and has additional laboratory facilities at the nearby Oakdale campus. In addition to specialized equipment in individual research laboratories, the Department has modern digital computers and computer graphics systems, electron microscopes, an electron microprobe, automatic isotope analyzers, and a cell culture facility, as well as darkroom and machine shop facilities. Through the first two years, graduate students are provided with individual study space adjacent to the departmental reading room, which supplements resources available at the Health Sciences Library.

Admission

An applicant must complete undergraduate studies in an accredited institution and have an overall and science grade-point average

of 3.0 or better on a 4.0 scale, coupled with strong performance on the Graduate Record Examination. The appropriate background for graduate study in physiology and biophysics includes an undergraduate major in one of the biological, chemical, physical, mathematics, or engineering sciences, with one or more years of coursework in biology, physics, chemistry (including physical chemistry), and calculus.

Courses

72:13 Introduction to Human Physiology 4 s.h.
Basic concepts of human physiology. Fall. Prerequisites: 37:3, 4:7-9 or equivalent, and consent of course director.

72:110 Neurobiology and Behavior arr.
Basic neurophysiology and neuroanatomy for medical students. Fall. Prerequisites: 60:103, 60:105, 72:212 or equivalent; consent of course director. Same as 50:110, 60:110.

72:118 Endocrinology for Medical Students 2 s.h.
Core course in medical endocrinology. First eight weeks of spring semester. Prerequisite: consent of course director. Same as 50:118, 60:118.

72:150 Intermediate Physiology arr.
Principles of physiology and detailed treatment of organ systems and cell types. Required of pharmacy and physical therapy students; available to graduates and advanced undergraduates with background in biology, physics, and chemistry. Spring. Prerequisite: consent of course director.

72:152 Mammalian Physiology 4 s.h.
Principles of physiology and detailed treatment of organ systems and cell types. Limited to dental students. Spring.

72:164 Human Physiology for Physician's Assistant Students 4 s.h.
Required for and limited to students in the Physician's Assistant Program. Taught in conjunction with anatomy and biochemistry. Summer.

72:199 Undergraduate Research in Physiology and Biophysics arr.
For students who are not master's or doctoral candidates of the Department of Physiology and Biophysics. Prerequisite: consent of the Department.

72:202 Exercise Physiology 2 s.h.
Basic concepts of acute and chronic adaptations to exercise. Students required to register under 72:311 for laboratory. Fall. Prerequisites: graduate standing and consent of course director.

72:203 Molecular Endocrinology 2 s.h.
Mechanisms of action of hormones, including effects on cyclic AMP function, intermediary metabolism, transcription, translation, and transport; discussion of molecular processes from hormone receptor interactions to biochemical and biological responses. Fall. Prerequisite: consent of course director. Same as 99:203.

72:204 Cellular Endocrinology 2 s.h.
Seminar course dealing with mechanisms of hormone synthesis, secretion, transport and target cell interaction, integration of hormone activities, and regulation of complex physiological phenomena. Spring. Prerequisite: consent of course director. Same as 99:204.

72:205 Endocrine Research Seminar 1 s.h.
Presentation and discussion of research activities and current literature in areas of endocrinology and metabolism. Prerequisite: consent of course director.

72:212 Medical Physiology 6 s.h.
Required of first-year medical students; open to graduate students with adequate preparation in biological and physical sciences. Spring. Prerequisite: consent of course director.

72:241 Membrane Biophysics 2 s.h.
Application of physical principles of analysis of membrane transport phenomena with emphasis on detailed development of analytical models used to interpret measurable parameters for natural and artificial membranes. Fall. Prerequisite: consent of course director.

72:243 Physiology of Excitable Membranes 2 s.h.
The basis of excitability as found in nerve and muscle cells: the generation of resting and action potentials, synaptic transmission, and the propagation of action potentials. Fall. Prerequisites: 72:212 or equivalent; consent of course director.

72:253 Advanced Gastrointestinal Physiology 2 s.h.
Lectures, conferences, and laboratory work. Spring. Prerequisites: 72:212 or equivalent, and consent of course director.

72:255 Research Seminar in Membrane Physiology and Biophysics 1 s.h.
Membrane-related phenomena in biological and model systems examined through critical evaluation of current research. Prerequisite: consent of course director.

72:262 Environmental Physiology 2 s.h.
Physiological responses, especially acclimatization, of mammals to extreme heat, cold, light, high and low pressure, space, and smog; laboratory exercises on telemetry, meteorological measurements, and activity recording. Prerequisites: 72:150 or equivalent; consent of course director.

72:265 Neurobehavioral Sciences Seminar 0-1 s.h.
Student-faculty discussion of current literature in research areas bearing on neurosciences and behavior. Same as 37:265, 60:265.

72:271 Advanced Cardiovascular Pharmacology and Physiology 2 s.h.
Pathophysiology of cardiovascular diseases and mechanisms of action of cardiovascular drugs. Fall, alternate years (1979-80). Prerequisite: consent of course director. Same as 71:205.

72:272 Seminar in Cellular and Molecular Biology 1 s.h.
Reports from current research and literature in cell and molecular biology: information transfer and regulation, assembly and developmental processes, membranes and transport. Same as 37:272, 60:272, 61:272, 71:272, 99:272. Prerequisite: consent of course director.

72:274 Advanced Exercise Physiology Seminar 2 s.h.
Immediate and chronic effects of exercise on biological systems. Students required to register under 72:312 for laboratory. Spring. Prerequisites: 72:212 or 72:150, and 99:130 and consent of course director.

72:281 Advanced Neurophysiology: Muscle 2 s.h.
Mechanical, chemical and thermal phenomena in skeletal muscle. Fall. Prequisite: consent of instructor.

72:282 Advanced Neurophysiology: CNS and Behavior 2 s.h.
Examination in depth of problems of information processing, sensory pathways, integration with internal state and behavior output. Spring. Prerequisite: consent of course director.

72:284 Advanced Techniques in the Neurosciences 1 s.h.
Demonstrations and discussions of techniques for anatomical, physiological, biochemical and behavioral research in neurosciences. Spring. Prerequisite: consent of course director. Same as 31:284, 37:284, 60:284, 71:284, 99:284.

72:301 Research: Physiology arr.

72:302 Research: Physiology arr.

72:303 Comprehensive Examination of Assigned Topics arr.

72:304 Comprehensive Examination of Assigned Topics arr.

72:311 Special Topics arr.

72:312 Special Topics arr.

72:341 Seminar: Physiology arr.

72:342 Seminar: Physiology arr.

72:401 Thesis arr.

72:402 Thesis arr.

Preventive Medicine and Environmental Health

Department head: Peter Isacson
Faculty: *professors* Clyde Berry, Clyde Frank, S.Y. Li Hsu, Peter Isacson, Peter Knapp, Peter Lachenbruch, Keith Long, Ming Tsuang
professors emeriti Irving H. Borts, H.F. Hsu, Franklin Top
associate professors Leon Burmeister, Kelley Donham, William Hausler, Walter Hierholzer, Franklin Kilpatrick, Judy Kondo, Franklin Koontz, Kenneth MacDonald, Donald Morgan, Robert Wallace, Robert Woolson
associate professors emeriti Lois Boulware, Marcus Powell
assistant professors Kathleen Bucher, William Clarke, Maurice Griffel, Joel Lehninger, Charles Yesalis
adjunct assistant professor Roger Tracy
Degrees offered: M.S., Ph.D.

Preventive medicine relates to the individual patient when knowledge and techniques from biological, medical, social and behavioral science are applied to prevent disease or its progression. It relates to the health of the entire community when the knowledge and skills of medical and allied sciences are applied in an organized community effort to maintain and improve the health of populations.

Environmental health is the study of control of the physical, biological and social factors of the environment and the manner in which they influence the health of the individual or groups of individuals.

The teaching of preventive medicine and environmental health at Iowa began in 1885, when a course in sanitary science and public health was introduced. The present Department was established in 1921.

Since its inception, the Department has continued to offer courses in many areas of preventive medicine and public health, including epidemiology and communicable disease control, institutional and food

sanitation, industrial hygiene, biometry, health services research, comparative medicine, agricultural medicine, and many other areas related to the health of communities. Many graduates of the Department have gone on to national and international achievement in public health work.

In 1955 the Department sponsored the development of the Institute of Agricultural Medicine, the first in the western hemisphere dedicated to the study of the occupational health problems of the agricultural worker. The varied programs of the Institute provide practical training for students of the health professions as well as for medical students at the graduate and postgraduate levels, and reflect a special interest in our rural environment.

The Department has an expanded and comprehensive biostatistics program, which offers both graduate and undergraduate instruction. Besides individual research in statistical methodology, extensive collaborative research is done with other departments, particularly in the College of Medicine. Departmental programs are enhanced through affiliations with the State Hygienic Laboratory, the University Environmental Health Service, Student Health Service, College of Engineering, the Health Services Research Center, and many regional health care delivery programs.

Medical epidemiology, while also linked to the clinical activities in the University Hospitals, is primarily oriented toward the community. Teaching and research are concerned with basic epidemiologic methods, but the emphasis is on application to community health problems. Areas of specific interest include the organization and delivery of health services, the description, etiology and control of both acute communicable and chronic diseases as well as clinical epidemiology. There is a special emphasis within the Department on the epidemiology of cardiovascular diseases and cancer.

Examples of specific ongoing programs include assistance in the development of evaluation of rural primary care health centers, conduct of a summer medical student primary care program for migrant farm workers, surveys of health service utilization behavior in Iowa communities, cardiovascular disease and hyperlipidemia screening programs, cancer epidemiology through the Iowa State Cancer Registry and the Iowa Cancer Epidemiology Research Center (both based within the Department), the epidemiology of diarrheal disease associated with enteropathogenic *E. coli*, major participation in evaluation of health services research activities on a university-wide basis, the study of the health effects of pesticides, the study of agricultural worker accidents and trauma, and many others. Consultation on epidemiologic problems is given widely in diverse areas of research and applied clinical and community activities.

The master's program offers a degree with an emphasis on environmental health, biometry, epidemiology, or a general track for those who are already health professionals. The Ph.D. program is available with an emphasis in epidemiology, biometry, environmental health, or health services research.

A limited amount of financial assistance is available within the Department.

Admission

Application deadlines for the fall and spring sessions are April 1 and October 1, respectively. No entering students are accepted for the summer session.

Minimum GPA requirements are 2.7 for admission to the master's program, 3.0 for the Ph.D. A minimum combined GRE score of 1050 is needed.

The applicant must have an undergraduate major or course background in science or mathematics, depending on the student's proposed program of graduate study.

The applicant must furnish three letters of recommendation. Wherever possible, a personal interview is desirable.

Courses

63:101 Health Science I 3 s.h.
Dynamics of health inherent in cells and tissues of man, and their augmentation by conscious effort of individuals and society.

63:102 Health Science II 3 s.h.
Human ecology in relation to potential and demonstrable effects of biological, chemical, physical and sociological factors of environment on health and life. Special recognition is given to food- and water-borne diseases, chemical contaminants of environment, including pesticides, water and air pollutants, diseases of animals transmitted to man, effects of population and urban and regional planning on health and disease.

63:103 Environmental Health Administration 2 s.h.
Programs of governmental and voluntary agencies directed at evaluation of environmental health problems and at planning for and delivering environmental health services: promotional and regulatory activities employed in environmental management, legal basis for such activities.

63:109 Community Health 2 s.h.
Introduction to epidemiology, clinical preventive medicine, organization and delivery of health services, environmental health and public health for sophomore medical students; emphasis on application of community and population skills to disease control and clinical problems.

63:110 Biostatistics 1 s.h.
Survey of statistical methods for persons who want a brief introduction to statistical terminology and methodology; topics include descriptive statistics, probability, binomial and normal distributions, confidence intervals, tests of hypotheses, terminology of clinical trials and epidemiology. Primarily intended for freshman medical students.

63:133 Public Health Aspects of Food and Housing arr.
Health aspects of food production and services, including laboratory and field training. Fundamentals of building and housing codes, their administration and enforcement. Environmental health problems peculiar to residential and institutional establishments.

63:158 Principles of Epidemiology 3 s.h.
Design and analysis of retrospective and prospective studies; historical and current examples of epidemiologic studies; etiologic factors in human disease, identified through study of distribution and determinants of disease in man.

63:161 Introduction to Biostatistics 3 s.h.
Topics include graphs and tables, descriptive statistics, probability, binomial and normal distributions, sampling distributions, tests of significance, confidence intervals, frequency data analysis. Prerequisite: college algebra.

63:162 Design and Analysis of Experiments in the Biomedical Sciences 3 s.h.
One-way layout, two-way layout, considerations in the planning of experiments, factorial experiments, Tukey's, Scheffe's, Dunnett's multiple comparison techniques, orthogonal contrast, transformations, regression and correlation. Prerequisite: 63:161. Same as 22S:140.

63:163 Introduction to the Design of Sample Surveys 3 s.h.
Techniques of constructing and analyzing sample surveys, including general methods of estimation, properties of estimators, simple random sampling, stratified sampling, ratio and regression estimators, systematic sampling and multiphase or cluster sampling. Same as 22S:103.

63:167 Biometrics and Bioassay 3 s.h.
Teach application of statistical analysis in design of experiments and interpretation of biological data; lectures include Student's t-test, analysis of variance, linear regression, chi-square, Fisher's exact probability, non-parametric methods, principles of bioassay and experimental design; laboratory exercises consist of practice in analyzing experimental biological data. Prerequisite: college algebra and consent of instructor.

63:168 Demographic Methods for Health Data 2 s.h.
Topics include rates and ratios, measurement of fertility, mortality and morbidity, collection of vital statistics, accuracy and error in data, construction of life tables, distribution of population, population estimates and projections; emphasis on life table analysis appropriate for mortality and morbidity data from long-term clinical studies of chronic diseases.

63:171 Problems in Preventive Medicine arr.

63:172 Independent Study and Research in Preventive Medicine arr.

63:173 Intermediate Design of Sample Surveys 2 s.h.
Intermediate course dealing with problems encountered in designing sample surveys, including construction and number of strata, unbiased ratio estimators, problems of systematic sampling, multi-staged sampling, double sampling, sampling frame construction problems, panel studies and problems due to nonresponse. Prerequisite: 63:163 or 22S:103.

63:176 Biostatistical Methods 4 s.h.
Topics include probability, distributions, moments, estimation, statistical inference for the one-sample and two-sample problem; analysis of frequency data; both parametric and nonparametric techniques are discussed. Prerequisite: 22S:120 or consent of instructor.

63:181 Introduction to Health Care Organization 3 s.h.
Introduces study of basic organizational arrangements of delivery of clinical and public medical services in the United States; considers determinants of utilization of health care system and how such utilization is altered by differences or changes in organizational structure, the amount and type of health resources and manpower available, the method of financing, and government and judicial regulation; comparisons with other national systems; types and methodologies of health care evaluation; social, political, economic, and educational forces which determine the future of health services are analyzed; projections are made. Same as 80:101.

63:191 Occupational Health 3 s.h.
Introduction to principles and practice of occupational health, industrial hygiene and safety, occupational health problems and their management. Prerequisite: consent of instructor.

63:193 Injury Control and Methods of Detecting Hazards 2 s.h.
Principles of evaluating, reporting and controlling injury in industry, agriculture and the general population. Organization, management and education for injury control.

63:201 Research in Preventive Medicine and Environmental Health arr.

63:203 Preceptorship in Preventive Medicine and Environmental Health arr.
Appropriate health programs; assigned readings; supervised teaching experience. One semester hour for 40 hours of preceptorship.

63:205 Epidemiologic Applications in the Health Services 4 s.h.
Survey of application of epidemiologic techniques to both research and pragmatic problems in organization and delivery of health services; topics include application of vital statistics, disease nosology, health information systems, health services utilization, planning and evaluation of both clinical and public health programs and health survey methodology. Same as 80:212.

63:209 Rural Health 3 s.h.
Rural and agricultural environment, in terms of specific health problems of rural residents and agricultural workers; clinical orientation is maintained, so that material will be of practical value to primary care physician and other health care personnel; agricultural accidents, rural/agricultural toxicity problems and zoonotic diseases stressed. Prerequisites: enrollment in professional medical curriculum, or 63:101, 63:102, 63:158 and consent of instructor.

63:210 Seminar 0-1 s.h.

63:211 Comparative Medicine Seminar 0-1 s.h.
Contemporary topics of comparative medicine; includes infectious diseases common to animals and man, the use of animal models, and aspects of veterinary public health. Prerequisites: 63:101, 63:102, 63:158 and consent of instructor.

63:217 Experimental Animal Techniques 2 s.h.
Designed to enable the individual in biomedical research training to perform many of the basic technical procedures required to carry out animal experiments; topics covered: basic anatomy and physiology of laboratory animals, restraint, identification, anesthesia, collection of body tissues and fluids, principles of surgery.

63:219 Animal Models of Human Disease 3 s.h.
Concept of comparative medicine as a problem-solving method in biomedical science; other topics include principles of species selection for animal experimentation, naturally occurring diseases of animals of comparative interest in man, genetic selection for animal models, animal models used in specific types of diseases or involvement of specific organ systems. Prerequisites: General Zoology, 63:101, 63:102, 63:161 and consent of instructor.

63:252 Theories of Environmental Policy 3 s.h.
Major environmental concerns to human health and the basis upon which governmental legislation has been created, enacted or proposed to deal with them; emphasis on data on which such policies are formulated. Prerequisite: 63:102.

63:253 Zoonoses 3 s.h.
Infectious diseases common to animals and man, studied utilizing modality of disease concept; diseases discussed under these environmental relationships: zoonoses of the rural environment, zoonoses of the urban environment, zoonoses of occupational significance to agricultural workers, zoonoses in foreign countries; epidemiology, diagnosis, prevention and control considered for each disease. Prerequisites: General Zoology, General Microbiology, 63:101, 63:102, 63:158, and consent of instructor.

63:256 Hospital Epidemiology 2 s.h.
Application of epidemiological methods to the consideration of the broad aspects of the positive and negative features of the care of hospitalized patients; classic use of epidemiologic concepts in the description, investigation, and control of hospital risks (infections, drug reactions, accidents, excess costs); opportunities for collection and use of hospital data for patient care evaluation in the context of current regulatory efforts.

63:257 Epidemiology of Infectious Diseases 2 s.h.
Review of underlying epidemiological concepts of infection and disease, causation, methods of transmission, diagnosis and control of infectious diseases, surveillance and sero-epidemiology; epidemiology and control of common infectious diseases, including venereal disease, congenital disease, respiratory diseases, enteric diseases, vector-borne diseases, relationship of infections to the etiology of cancer.

63:258 Advanced Epidemiology Methods 3 s.h.
Extends theoretical and applied methods of epidemiology begun in introductory course; topics include critical review of epidemiological study design, data handling and bias; adjustment of rates; estimation of risk; matching; clinical trials, epidemic models and simulation; cluster analysis; life tables; data sources, questionnaire design, discrimination analysis and relation to disease classification. Examples taken from acute, communicable, chronic and genetic diseases, as well as medical care organization and delivery.

63:259 Chronic Disease Epidemiology 3 s.h.
Application of standard basic epidemiologic methodology in a systematic fashion to current problems of cancer, cardiovascular disease, respiratory disease and other major chronic diseases, data from Iowa used wherever possible. Prerequisite: 63:158 and 63:161 or consent of instructor.

63:260 Environmental Toxicology 3 s.h.
Sources, routes of absorption and effects of environmental toxicants affecting man; pathophysiology of toxicant actions, including those of metals, pesticides, solvents, other industrial chemicals. Prerequisites: physiology or biochemistry.

63:261 Survival Data Analysis 3 s.h.
Life tables; product-limit estimates; inference under exponential; Weibull, Gamma models with and without censoring; nonparametric methods; methods of handling covariates; robustness of methods. Prerequisite: 22S:120 or consent of instructor.

63:263 Environmental Health Technology 3 s.h.
Designed to provide students with an understanding of environmental health laboratory function, its role in decision making, quality assurance programs and how they operate, laboratory instrumentation characteristics, reliability of results and application to solution of environmental health problems. Prerequisite: organic chemistry.

63:271 Advanced Occupational Health 3 s.h.
Experience in making individual plant studies, performing program reviews and other assignments designed to meet specific needs of the individual student.

63:273 Health Data Systems 3 s.h.

63:276 Intermediate Biostatistical Methods 4 s.h.
Continuation of 63:176. Linear regression and correlation; multiple regression, single factor experiments, multiple comparison, orthogonal contrasts, multiple factors, crossed and nested experiments, block designs, Latin Squares, confounding, analysis of covariance; both parametric and nonparametric techniques are discussed. Prerequisite: 63:176 or consent of instructor.

63:300 Thesis arr.

63:998 Special Study arr.

63:999 Special Studies arr.

Psychiatry

Department head: George Winokur
Faculty: *professors* Remi Cadoret, Arthur Carter, John Clancy, E. Martin Gal, Harold Mulford, Herbert Nelson, Russell Noyes, Mark Stewart, Ming Tsuang, George Winokur
professors emeriti Paul Huston, Richard Jenkins, John Knott
associate professors Nancy Andreasen, Raymond Crowe, Richard Finn, Fritz Henn, Katherine A. Halmi, Jan Loney, Vasantkumar Tanna, Rafiq Waziri
assistant professors William Coryell, Alan Horowitz, Barry Liskow, Michael Lowry, Ralph Maurer, Conrad Schwartz
instructor Frederick Dunner
clinical assistant professors Richard Beaika, Noel Brown, John Hege, James Kennedy, Selig Korson, Paul Penningroth, Michael Taylor
adjunct assistant professors John Langhorne, Warren Edwards
clinical instructors Bruce Ambler, Bhasher Dave, Nestor Pangilinan, Robert G. Rohs, Michael Taylor
clinical lecturer Thomas Hansen
adjunct lecturer James Marchman

The Department of Psychiatry is engaged in teaching medical students and training resident physicians for academic and clinical careers in psychiatry. The instruction of medical students occurs principally during their third year, in the course of a six-week clerkship. No degree program is available.

The Department maintains a four-year training program approved by the Residency Review Committee of the American Medical

Association. Training experiences are available at the University of Iowa Hospitals and at the Iowa City Veterans Administration Hospital. Additional experiences are available at affiliated institutions: Broadlawns Hospital in Des Moines, the Iowa Security Medical Facility at Oakdale, the Mid-Eastern Iowa Community Mental Health Center in Iowa City, and the Mental Health Institute at Independence, Iowa.

The Department offers an approved two-year residency in child psychiatry.

The Department staff is actively involved in genetic and family studies of psychiatric disorders, and includes a number of experts in the fields of genetic and biological psychiatry and neurochemistry.

A variety of opportunities is available for students and residents to participate in research. The basic science areas of neurochemistry, neurophysiology, and electroencephalography offer additional opportunities to students and residents for special study and research. The clinical areas of psychology and child psychiatry and group psychotherapy also offer opportunities to a limited number of students for research and further study.

Courses

73:100 Psychiatry for Physician's Assistant Students arr.

73:101 Psychiatry Elective for Physician's Assistant Students arr.

73:230 Research in Psychiatry arr.
Medical students, graduate students, and physicians who have had training in scientific methodology admitted for special investigations in biological or psychological problems related to psychiatry.

73:231 Problems in Psychiatry arr.

Courses open only to medical students

73:5 Clinical Psychiatry 6 s.h.
Junior medical students.

73:30 Modern State Hospital Psychiatry, Mental Health Institution, Independence, Iowa arr.

73:31 General Hospital Psychiatry arr.
Psychiatric Consultation Service, University Hospitals and Clinics.

73:32 Psychiatric Disorders of Children and Adolescents, Independence, Iowa arr.

73:33 Adult Psychiatry, Psychiatric Hospital arr.

73:34 Hospital Psychiatry, VA Hospital, Iowa City arr.

73:35 Child Psychiatry, Psychiatric Hospital, Children's Services arr.

73:36 Advanced Clerkship in Child Psychiatry arr.
Recognition and diagnosis of psychiatric disorders of childhood; introducing techniques of demonstrated effectiveness for remedying psychiatric illnesses of childhood.

73:37 Emergency Room Psychiatry, Broadlawns Hospital, Des Moines 4, 8 s.h.

73:38 Advanced Clerkship in Adolescent Psychiatry arr.
Common psychiatric disorders of adolescents; student develops increased competence in participation on a treatment team.

73:39 Community Child and Adolescent Psychiatry arr.
Student observes and performs, under supervision, some of the techniques of mental health intervention used by community agencies.

73:40 Consultative Child Psychiatry arr.
Roles of child psychiatry as a consultation service.

73:42 Correctional Psychiatry, Iowa Security Medical Facility, Oakdale, Iowa arr.

73:46 Preceptorships in Transcultural Psychiatry arr.

73:47 Elective in Clinical Psychopharmacology arr.

73:48 Advanced Preceptorship in State Hospital Psychiatry arr.

73:62 Hypnosis in Clinical Medicine 1 s.h.

73:105 Research Psychiatry arr.
Senior medical student may obtain experience and training in practical application of scientific methodology by affiliating with an on-going research project at the Psychiatric Hospital or at affiliated and cooperating Research Centers.

73:106 Research Psychiatry off Campus arr.
Description same as for 73:105, except by special arrangement at Research Centers off campus, in this country and abroad.

73:998 Special Studies on Campus arr.

73:999 Special Studies off Campus arr.

Radiation Research Laboratory

Program director (acting): James W. Osborne
Faculty: *professors* Richard L. DeGowin, James W. Osborne, Edgar F. Riley, Jr.
associate professors Frank Hsieh-Fu Cheng, James C. Ehrhardt
assistant professors Larry W. Oberley, Reggie H. Stevens
Degrees offered: M.S., Ph.D.

The program provides in-depth training and research experience in the study of the physical, chemical and biological effects of radiation and the theory and widespread application of radioisotope methodology. The program stresses the importance of these areas to scientific research, clinical medicine and the general public.

Undergraduate Programs

There are no complete programs, but two courses, 77:103 Introductory Radiation Biology and 77:106 Environmental and Radiological Health Physics are open to students of liberal arts or professional colleges. They should be of interest to students who plan to enter medicine, nuclear medical technology, environmental health or similar programs.

Graduate Programs

The M.S. degree in radiation biology emphasizes the technical aspects and serves well as a minor field for students whose major interest is in another, but related, field.

The Ph.D. program in radiation biology is open to graduate students with a background of study in physics, chemistry, mathematics, biology, health sciences, veterinary medicine or engineering. Ordinarily, the M.S. in this or a related field is required for admission to the Ph.D. program, but consideration will be given to other methods of qualifying.

After completion of the introductory course, the student may emphasize a particular aspect of the field. The details of the program are built around previous training, interests, abilities and career objectives. Some students elect to emphasize training in physical aspects, such as radiological physics or health physics. Others major in biological aspects. In either case, a broad base rather than complete specialization is the goal. In addition to formal lectures, the programs involve small group conferences and discussions. Laboratory exercises are emphasized, and the student has the opportunity to become familiar with many types of instruments and techniques. It is recommended that a candidate for the Ph.D. have a reading knowledge of scientific French or German and competence in biological statistics or computer programming before taking the final examination. Students will have at least one semester of experience as a teaching assistant and at least one as a research assistant.

Special Programs

Postdoctoral training is available by arrangement with the program chairman and individual faculty members.

Special Facilities

The Radiation Research Laboratory has an X-ray generator and other radiation sources. Students and staff members also have access to other radiation sources, such as the Co-60 gamma source in the Department of Radiology and the reactor of the Biology Division at Argonne National Laboratory.

The Radiation Research Laboratory has a variety of radiation detectors and counters, including liquid scintillation counters and a small animal whole-body counter, and it has access to the human whole-body counter at the Iowa City Veterans Administration Hospital.

The Laboratory also has an electron spin resonance spectrometer, an ultraviolet spectrophotometer, an automatic cell counter and particle sizer, an electron microscope and shadow caster, and facilities for preparing histological sections of tissues—fixed or frozen—and autoradiographs.

Three air-conditioned rooms provide convenient housing for the small laboratory animals used in research and teaching.

Departmental Financial Aids

Graduate students are supported as research assistants when possible from funds available through research grants and contracts or as teaching assistants from departmental funds. Some awards are also available to graduate students and postdoctoral students through the U.S.P.H.S. Research Service Award program to support training in biomedical radiation research. Individual postdoctoral awards are also possible and are applied for jointly by a candidate and the faculty sponsor.

Courses

77:103 Introductory Radiation Biology **4 s.h.**
Characteristics and biological effects of ionizing radiations, properties and uses of radioisotopes, medical applications, biological basis for protection procedures. Every fall and every other summer in odd years. Prerequisite: consent of instructor.

77:106 Environmental and Radiological Health Physics **3 s.h.**
Radiation hazards, control regulations, problems of design and use of radiation facilities in medical, academic and industrial situations; exposure and dose measurements in radiation environments. Spring, odd years. Prerequisite: 4 s.h. of physics or chemistry.

77:207 Seminar: Radiation Research **1 s.h.**

77:208 Seminar: Radiation Research **1 s.h.**

77:211 Physics of Radiobiology I **4 s.h.**
Characteristics of X-ray machines, nuclear accelerators and teletherapy devices; properties of X rays and gamma rays and their interaction with matter; radiation exposure and depth dose measurements; radiation therapy. Fall, odd years. Prerequisites: 8 s.h. of physics and consent of instructor.

77:212 Physics of Radiobiology II **4 s.h.**
Diagnostic X-ray physics; physics of nuclear medicine; radiation methods in physical biochemistry. Spring, even years. Prerequisites: 8 s.h. physics and consent of instructor.

77:220 Mammalian Radiobiology **4 s.h.**
Radiation effects on organ systems in mammals; spleen and bone-marrow transplantation, agents which modify radiation response, radiation carcinogenesis. Spring, odd years. Prerequisites: 77:103 and consent of instructor.

77:223 Cellular Radiobiology **4 s.h.**
Radiation and cell growth, multiplication, differentiation and function; modification of radiation effects; effects on immunity; cell kinetics of tumor and host tissue. Spring, even years. Prerequisite: 77:103 and consent of instructor.

77:224 Radioisotopes in Biological Research **arr.**
Uses of radioisotopes in a number of biological systems; eight-week emphasis on beta assay, especially liquid scintillation counting; second eight weeks deal with assay of gamma emitters. Spring, even years.

77:228 Radioisotopes in Clinical Investigations **4 s.h.**
Properties and uses of radioactive isotopes (including I-131, Cr-51, Fe-59, Co- 60, Au-198, P-32, Na-24, K-42, Tc-99m and other labeled compounds) in clinical investigations. Summer, even years. Prerequisite: 77:103 or consent of instructor.

77:305 Research: Radiobiology **arr.**

77:306 Research: Radiobiology **arr.**

77:307 Special Topics **arr.**

77:308 Special Topics **arr.**

77:309 Thesis **arr.**

77:310 Thesis **arr.**

Radiology

Department head: James H. Christie
Faculty: *professors* Robert C. Brown, James H. Christie, Steven H. Cornell, Kenneth D. Dolan, Herbert L. Jackson, Howard B. Latourette, James W. Osborne, Richard E. Peterson, Edgar F. Riley, Rolf L. Shapiro
associate professors Hsieh F. Cheng, Lee C. Chiu, James C. Ehrhardt, Raymundo T. Go, Hamed H. Tewfik
assistant professors Kenneth C. Chow, Georges Y. El-Khoury, Charles G. Jacoby, William L. McGinnis, Larry W. Oberley, Reggie H. Stevens, David K. Yousefzadeh
associates Monzer M. Abu Yousef, Ming J. Hsieh, Chun H. Lu, M. Faysal Mudarris, John E. Shevland, Owen C. VanKirk
instructor Glenn A. Isserstedt

The Radiology Department's teaching program is designed to meet the variable needs and interests of fourth-year medical students in diagnostic radiology, nuclear medicine and radiation therapy.

Rotations through the various subdivisions of radiology—chest, gastrointestinal, genitourinary, head and neck, nuclear medicine, orthopaedic, pediatric, special procedures, and therapy—will be designed according to the area of interest of each student who chooses this rotation.

Courses

74:1 Clinical Radiology **arr.**
Clinical rotation in radiology of chest, bone, abdomen, head and neck, pediatrics, angiography, neuroradiology; diseases, nuclear medicine techniques; aims and techniques of radiation therapy. Ten students, four weeks, offered June through May. May be repeated.

74:5 Radiology for P. A. **arr.**

74:100 Nuclear Medicine Practicum I **arr.**
Clinical rotations in nuclear and special imaging and in vitro laboratory. Offered first semester only to students in the Nuclear Medicine Technology Program.

74:101 Nuclear Medicine Practicum II **arr.**
Clinical rotations in nuclear and special imaging and in vitro laboratory. Offered second semester only to students in the Nuclear Medicine Technology Program.

74:102 Nuclear Medicine Practicum III **arr.**
Clinical rotations in nuclear and special imaging and in vitro laboratory. Offered June through August only to students in the Nuclear Medicine Technology Program.

74:901 Clinical Radiology Elective **arr.**
Rotations off campus to one of several participating departments offering the opportunity to observe and participate in the clinical activities of radiology departments in a community hospital. Four weeks, offered July through May.

74:998 Special Studies on Campus **arr.**
Arranged on-campus special projects in radiology. Subscription time arranged. Offered June through May.

74:999 Special Studies off Campus **arr.**
Arranged off-campus rotation. Subscription time arranged. Offered June through May.

Surgery

Chair: Sidney E. Ziffren
Faculty: *professors* Janusz Bardach, Robert J. Corry, Donald B. Doty, Johann L. Ehrenhaft, Carl J. Graf, Edward E. Mason, George E. Perret, Kenneth Printen, Nicholas P. Rossi, Robert T. Soper, John C. VanGilder, Creighton B. Wright, Sidney E. Ziffren
clinical professor David Watkins
professors emeriti John A. Gius, Louis T. Palumbo, Frank R. Peterson
associate professors Raphael S. Chung, Dennis E. McDonnell, Peter R. Jochimsen, David G. Reynolds, Siroos Safaie-Shirazi, Wilbur L. Zike
clinical associate professors Romeo S. Berardi, Lester R. Dragstedt II, John K. MacGregor, Frederick Staab
assistant professors Adel S. Al-Jurf, Alan E. Anderson, Berkeley Brandt III, Albert E. Cram, Cordell E. Gross, Nelson J. Guril, Neal F. Kassell, Gerald P. Kealey, Wade C. Lambert, Jr., Jeffrey W. Lewis, Arnold H. Menezes, Joseph L. Skibba, Thomas Vargish, John C. West
clinical assistant professors A.J. Herlitzka, Richard E. Hockmuth, Charles A. Johnson, Kennth H. McKay, Samuel D. Porter, Walter J. Riley

Courses in surgery provide opportunities for a unique combination of patient-care-oriented experience and basic surgical research designed to give the interested

student an awareness of the place of surgery among the physician's skills. These courses are available only to medical students and qualified students in associated health sciences.

The student in surgery develops awareness of surgical therapy's place in the treatment of disease. Emphasis is placed upon basic emergency techniques; traumatology; oncology; burns; gastrointestinal and biliary tract disease; endocrine disease; transplantation; plastic surgery and reconstruction; peripheral vascular surgery; thoracic and cardiovascular surgery; and neurosurgery.

A majority of the courses involve patient-centered discussions and practical exercises interspersed with operating room experience. Lectures and conferences are regularly scheduled on specific topics.

Special courses in selected topics of surgical research, independent study and clinical experiences are available to individual fourth-year students by special arrangement with the faculty.

The Faculty

Special faculty strengths are centered in the fields of pathophysiology and problems of severe burns, organ transplantation, the surgical control of morbid obesity, inflammatory bowel disease, the pathophysiology of biliary tract disease, pediatric surgery and plastic surgery. The thoracic-cardiovascular and neurological surgeons have particular expertise in the clinical management of the spectrum of diseases in their specialities.

Facilities

The Department has adequate surgical patients for teaching. Special areas include the Burn Unit, the only one of its kind in the state, which provides adequate patient material for both clinical and basic science research.

Laboratories provide equipment, space and technical expertise necessary to support teaching and a wide spectrum of clinical and scientific research. These laboratories include: Animal Operating; Tissue Culture; Gastroenterology; Microbiology; Peripheral Vascular; Transplantation; Organ Preservation; Cardiovascular; and Neurosurgery and Oncology.

Courses

75:1 Basic Emergency Skills 0 s.h.
Sixteen-hour primer course in emergency medical techniques; emphasis on practical exercises and application of lecture material.

75:2 Vascular Research arr.

75:5 Clinical Surgery 6 s.h.
Six-week course in clinical surgery; required of junior medical students.

75:100 Emergency Room for Physician's Assistant Students arr.

75:110 Surgery Elective for Physician's Assistant arr.

75:216 Advanced Clinical Surgery arr.
Students assume advanced responsibility for patient care on wards and in operating room on one surgical service. Prerequisites: 75:5 and consent of instructor.

75:217 Advanced Surgical Externship arr.
Advanced externship experience at outside teaching center. Prerequisites: 75:5 and consent of instructor.

75:219 Surgical Oncology arr.
Intensive experience in diagnosis and operative management of tumors; student instructed in cancer chemotherapy including infusion and perfusion techniques; student attends breast and lymphoma conferences. Prerequisites: 75:5 and consent of instructor.

75:220 Clinical Research and Oncology arr.
Investigation of clinical problems related to neoplastic diseases; project culminates in publishable manuscript; sophomores and juniors encouraged to begin prospective projects; seniors limited to reviews. Prerequisite: consent of instructor.

75:221 Emergency Room on Campus arr.
A preceptorship with house officers and faculty in which the principles of acute medicine are emphasized. The student will perform under the close supervision of the house officer or staff physician responsible for the Emergency Service. Student evaluation will be based on his performance in the Emergency Room.

75:222 Emergency Room off Campus arr.
A preceptorship with house officers and faculty in which the principles of acute medicine are emphasized. The student will perform under the close supervision of the house officer or staff physician responsible for the Emergency Service. Student evaluation will be based on his performance in the Emergency Room. Students may elect this course at one of several affiliated hospitals.

75:223 Burn Therapy arr.
Student becomes member of burn team on ward and in operating room; experience emphasizes wound healing and fluid and electrolyte therapy. Prerequisites: 75:5 and consent of instructor.

75:224 Pediatric Surgery arr.
Designed for interest in pediatrics or surgery; intensive clinical experience involving ward, operating room and outpatient clinics; attendance at both surgical and pediatric conferences. Prerequisites: 75:5 and consent of instructor.

75:225 Transplantation Surgery arr.
Involvement in intensive experience on renal transplant team; considerable exposure to coordinated efforts of other medical disciplines (internal medicine, urology) in daily rounds and conferences; assistance in research project expected. Prerequisites: 75:5 and consent of instructor.

75:227 Clinical Neurosurgery arr.
Advanced clinical clerkship designed for interest in neurologic diseases; emphasis on diagnosis of neurological disorders as well as operative therapy; student attendance at related conferences with radiology and neurology expected. Prerequisites: 75:5 and consent of instructor.

75:229 Research Surgery arr.
Student researches, plans and organizes project with member of surgical faculty; student expected to write report at end of his or her project. See Department head for ongoing projects. Prerequisite: consent of instructor.

75:232 Clinical Cardiovascular Surgery arr.
Students may concentrate interest in vascular, cardiac or thoracic surgery; attendance at all scheduled conferences of Division; students spending maximum time on service expected to assume intern responsibilites and complete short-term research project. Prerequisites: 75:5 and consent of instructor.

75:233 Research in Cardiovascular Surgery arr.
Short- or long-term research project arranged with instructors; may involve clinical material or laboratory; organization and completion of publishable manuscript. Prerequisite: consent of instructor.

75:234 Surgical Externship at Veterans Administration Hospital, Des Moines arr.
Concentrates on gastric, thoracic or vascular surgery; participation in conferences, ward work, operating room and research laboratory. Evaluation by examination. Room, board and laundry provided. Prerequisites: 75:5 and consent of instructor.

75:235 General Surgery Iowa Meth Med Center 4 s.h.

75:555 General Surgery for Physician's Assistant Students arr.

75:998 Special Studies on Campus arr.
Arranged by student with approval of Department.

75:9 Special Studies off Campus arr.

Urology

Department head: David A. Culp
Faculty: *professors* David A. Culp, Charles E. Hawtrey
professor emeritus Raymond G. Bunge
associate professors William W. Bonney, David M. Lubaroff
assistant professors Stephan Loening, Bernard Fallon
associates Walter L. Gerber, Ambati S. Narayana

Modern urology is concerned with diseases of the entire urinary tract of the male and female, and with the male genital tract.

In addition to the areas of urinary tract stone, urinary tract infections, diagnostic urology, and the results of urinary tract obstruction, urology also includes urological nephrology, dialysis, homotransplantation, urologic oncology, urologic endocrinology, and pediatric urology.

The Department offers courses in all these fields, at the undergraduate and graduate levels and in continuing education for the delivery of urologic care.

In the first year of medicine, the Department participates with several of the basic science departments in cooperative endeavors to teach the relationship of urology to the basic sciences. In immunology, as it relates to

transplantation and to cancer, the Department participates actively with the Department of Microbiology.

The Department participates very actively in Introduction to Medicine, which involves the entire second semester of second-year medicine. The Department offers courses calculated to illustrate the diagnosis and treatment of diseases involving the genitourinary tract in the male and the urinary tract in the female and child.

In the third and fourth years of the curriculum in medicine, the Department offers courses in diagnostic urology, radiologic urology, urological oncology, and the entire field of urology. In the required third-year clerkship, the Department offers the basics of this material, and in the fourth year it offers advanced elective courses of intensive study in these areas.

Continuing education is offered throughout the year for urologic and family practitioners.

These activities are conducted by a seasoned staff whose members have intense interest in certain areas, including pediatric urology, reproductive physiology, urologic oncology and prostatic diseases.

A special area, in which the Department has earned international recognition, has been created for the study of prostatic diseases.

The urological laboratories are active and offer instruction in research in various areas of urology. Special courses in these areas are available on an elective basis.

Courses

79:104 Clinical Urology **2 s.h.**
Provides intensive two-week course of study on urology wards; junior medical students responsible for patient care under supervision of residents, undertaking initial evaluation and assistance in pre- and postoperative care of patients; exposure to clinical and diagnostic urology through visits to Urology Outpatient Department and Referral Center; situational case reviews and topics in urology covered daily by senior staff personnel.

79:108 Advanced Clerkship **arr.**
Student becomes integral member of urological staff, spends full time in Department for four weeks; assignment to outpatient department; under direction of junior and senior staff, responsibility for obtaining history, performing physical examination, conducting diagnostic evaluations, and following therapeutic manipulations of assigned patients; prepares critique for each patient, interpreting history in terms of pathologic lesion; significance of the laboratory, roentgenographic, and instrumental examinations; reasons for choice of therapy; lessons learned in managing case; oral examination based upon student's experiences conducted by senior urologic staff at conclusion of clerkship.

79:109 Advanced Clerkship VA **4 s.h.**

79:110 Individual Study and Research **arr.**
Individual projects, either preclinical or clinical, will be constructed by the class member and faculty representatives consisting of the urological senior staff, and where applicable a member of another clinical department or preclinical department as dictated by the problem to be undertaken. No program can be approved or instituted without the permission of the head of the Department in order to clear the use of space and funds. Upon completion of the project the student will prepare a thesis and undergo an oral examination.

79:111 Uro-Radiology **arr.**
Full time in departments of Urology and Radiology, where indications, contraindications, complications, and techniques of uroradiographic procedures are presented and discussed; practice in interpretation of films provided; course members attend all departmental conferences.

79:112 Uro-Pathology **arr.**
Participation with Urology and Pathology departments in study of uropathologic material derived from postmortem examinations and surgical procedures; additional study of collected pathologic material, both gross and microscopic, provided from teaching material maintained in both departments; at completion of course, preparation of written discussion of pathologic materials seen during period of study, with particular emphasis placed upon correlation of pathologic and clinical findings; practical examination of microscopic and gross specimens as well as written examination.

79:114 Prostatic Disease **arr.**
Research and clinical study of prostatic diseases; arrangements made to provide experiences in Department's ongoing research in carcinoma of prostate; special related projects of individual interest may be arranged; clinical material with prostatic disease assigned as available; at conclusion of period, thesis prepared covering research activity; written examination covering clinical experience.

79:115 Urological Oncology **arr.**
Intensive clinical experience in diagnosis and management of all types of genitourinary neoplasms; acquisition of understanding of general principles in differential diagnosis and surgical, radiation and chemotherapeutic modalities utilized in care of genitourinary cancer; participation in Department's ongoing research in prostatic carcinoma expected; at conclusion of course, thesis prepared on some aspect of one of these tumors; written examination.

79:116 Male Endocrinology and Reproduction **arr.**
Acquaintance with current status of male endocrinology, laboratory methods of measuring essential parameters, assessment and management of clinical problems; time devoted to evaluation of male infertility problems and methods of determination of potential levels, such as testis biopsies and hormone levels; management of clinical cases learned; from time to time, cases of intersexuality discussed.

79:120 Urology Elective for Physician's Assistant **arr.**

79:998 Special Studies on Campus **arr.**
Individually arranged by student with the approval of the Department.

79:999 Special Studies off Campus **arr.**
Individual preclinical or clinical project constructed by class member and faculty representatives of urological senior staff and, where appropriate, member of another preclinical or clinical department; no program can be approved or instituted without permission of Department head; upon completion of project, thesis prepared followed by oral examination.

College of Nursing

Dean: Evelyn R. Barritt
Acting assistant dean, graduate program: Marilyn T. Molen
Assistant dean, undergraduate program: Patricia M. Ostmoe
Assistant dean, continuing education: Merle Heick
Faculty: *professors* Evelyn R. Barritt, Teresa E. Christy, June L. Triplett
professors emeritae: Gladys S. Benz, Eva H. Erickson
associate professors Sister Rebecca Fidler, Mildred I. Freel, Marjorie Gould, Laura K. Hart, Nancy Jordison, Rosemary J. McKeighen, Etta H. Rasmussen, Hope C. Solomons, Barbara S. Thomas, Ann Whidden
associate professors emeriti Marjorie E. Lyford, Anna F. Overland
assistant professors Sara Arneson, Gloria Bulechek, Marjorie Bottoms, Carolyn M. Crowell, Barbara R. Cunning, M. Patricia Donahue, Phyllis Franck, Rose Marie Friedrich, Orpha J. Glick, Merle A. Heick, Louise G. Kruse, Jean A. Lakin, Sonja Lively, Eleanor McClelland, Betty L. Martin, Sandra Pfaff Miller, Patricia Ostmoe, Sandra R. Powell, Marjorie A. Price, Jean L. Reese, Toni T. Reimer, Ruth H. Rogers, Laura Roskoski, Lavonne Ruther, Beverly Saboe, Annette Scheffel, Miriam Schrock, Kathryn Schweer, Mary Lou Smith, Sandra S. Sweeney, Alberta A. Tedford
assistant professors emeriti Joella J. Antes, Mary Rock, Pearl Zemlicka
instructors Evelyn Benda, Teresa Bennett, Barbara J. Blackman, Ann Chappell, Boonchuan Chermprapai, Toni Clow, Francine Davis, Jessie S. Daniels, Paulette DiAngi, Diane R. Fabre, Diane Fager, Marie Faynor, Rita Frantz, Ruth Gingerich, Constance G. Heim, Carolyn Hudgens, Sheryl L. Miller, Paula Mobily, Pamela Pletsch, Margaret Rankin, Mary Alice Ray, Carmela Rehtz, Denise Ross, Lucinda Skelley, Nancy Spalj, Mary K. Stewart, Susan L. Uecker, Marilyn K. Weissman
Degrees offered: B.S.N, M.A.

The College of Nursing is an integral part of the University Health Center, sharing in and contributing to teaching, research and patient-care resources which have earned international recognition. This provides an unusually fine setting for college preparation for nursing, because the educational and clinical resources which are needed to educate nurses are available on or near the campus. This also makes it possible for the faculty and students to participate fully in University life and to contribute their time, interest and abilities to the many general and special activities of a major and modern university.

Both the baccalaureate and graduate programs are accredited by the Department of Baccalaureate and Higher Degree Programs of the National League of Nursing, the professional accrediting agency for college and university programs of nursing education.

The University of Iowa baccalaureate program is approved by the Iowa Board of Nursing and its graduates qualify to take the licensure examination required for practice as registered nurses.

Undergraduate Program

Men and women educated as professional nurses are in demand in a variety of jobs and settings, among them community health nursing services, doctors' offices, clinics, hospitals, armed forces, the Peace Corps, the World Health Organization, the Red Cross, home and foreign missions, youth camps and professional organizations. A professional nurse may be engaged in clinical nursing, teaching, research or private practice.

A bachelor's degree program, such as that offered by The University of Iowa, provides college-level preparation for careers in the hospital care of patients and in such community agencies as public health services, schools and industries. In addition, it provides the essential base for graduate study in nursing.

In addition to the advantages of combining general education with specific career preparation, a college or university program offers the advantages—hardly less important—of full participation in the social, cultural and recreational activities of a highly diversified campus community. In nursing no less than in other pursuits, a college or university background enables many young people not only to realize their highest career potentialities, but to achieve the greatest measure of self-fulfillment in life.

The baccalaureate program is designed to provide both liberal and professional education. The basic 128-semester-hour program consists of 38 semester hours of general education courses, 40 semester hours of supportive prenursing courses and 50 semester hours of coursework in nursing. Enrollment in nursing courses during one summer session is required. A second summer session in a nursing core course is not guaranteed. Therefore, most students complete the program in four academic years and one summer session.

Course offerings are based on the concepts of health, deviations from health and nursing intervention, and are presented in progressive levels of complexity from the sophomore through the senior year.

The curriculum reflects the current trend in health care delivery toward greater emphasis on nursing as a service rendered outside hospitals and to other than the acutely ill. The curriculum provides for nursing electives and permits the selection of an area for beginning concentration in the senior year.

With the first nursing course, the student will have the opportunity to apply his or her learning by caring for individuals in a variety of settings.

Approaches to the College of Nursing

The student may complete the entire program at Iowa, enrolling the first year in the University's College of Liberal Arts, or transfer from an institution offering a two-year sequence of specific courses approved by the College of Nursing.

Cooperating institutions in the two-year transfer plan include: Iowa State University, the University of Northern Iowa, and Upper Iowa, Briar Cliff, Morningside, Loras, Luther, Clarke, Simpson, Wartburg and Ottumwa Heights colleges. Participating community colleges are located in Mason City, Marshalltown, Muscatine and Fort Dodge.

Completion of the two-year transfer sequence at a cooperating institution does not guarantee admission to the College of Nursing; admission standards for two-year transfers are the same as for all other College of Nursing applicants. Prospective two-year transfer students who want more information about this plan should contact the cooperating institution of their choice.

Registered Nurses

With some modifications, registered nurses who enroll in the baccalaureate program in nursing at Iowa complete the same liberal arts and science courses as students with no previous nursing preparation. Registered nurses planning to enter the baccalaureate program at Iowa should obtain special information and advice from the College of Nursing.

Faculty Advisers

Advisers from the College are available to help prospective nursing students plan their programs, and each student in the College works with a faculty adviser.

Student Organizations

College of Nursing students have their own Association of Nursing Students and are also eligible for membership in the state and national associations of nursing students.

Expenses

Students pay the general University fees throughout the program, and purchase their own uniforms. The cost of a uniform order currently is about $65. Students must also purchase white shoes, a stethoscope and a watch with a full-sweep second hand. Students usually need to provide their own transportation once enrolled in clinical nursing courses.

Financial Aid

In addition to the assistance available to University students generally, there are assistance programs specifically for nursing students. For further information about financial assistance, write to the University Office of Student Financial Aids.

Admission

High School Background

There are no specific high school course requirements for admission to the College of Nursing, but the College strongly recommends four years of English, two years of history, two and one-half years of mathematics and one year each of biology, chemistry and physics, plus other college preparatory courses selected with the help of the high school counselor.

College Background

Applicants for admission to the undergraduate program in nursing must present a minimum of 30 semester hours completed in an accredited college, including three of the five required biological science courses and satisfaction of the following general education requirements:

Rhetoric—Eight semester hours (may be satisfied by testing for advanced standing; a student who has earned six semester hours of credit in English composition may complete the speech component after admission; non-University of Iowa students transferring 40 or more semester hours of credit are exempt from the rhetoric requirement);

Mathematics—Two and one-half years of high school mathematics, or a satisfactory score on the mathematics battery of the American College Tests, or completion of a college course in mathematics comparable to or higher than intermediate algebra (22M:1);

Chemistry—High school chemistry or its equivalent (if taken at the college level it may be included in the 30 semester hours required for admission); and

Physics—High school physics or its equivalent (if taken at the college level, it may be included in the 30 semester hours required for admission).

Four semester hours in the historical-cultural core area and four in literature are required for graduation in nursing, and may be included in the 30 semester hours presented for admission.

Preclinical Background

Including the biological science courses required for admission to the College, the student must satisfy the following requirements before beginning clinical nursing coursework:

Animal Biology	5 s.h.
Chemistry (Organic and Biochemistry)	5 s.h.
Human Anatomy	4 s.h.
Human Physiology	4 s.h.
Microbiology	4 s.h.
Nutrition	3 s.h.
Psychology	4 s.h.
Sociology	4 s.h.
Anthropology	4 s.h.
Human Development and Behavior	3 s.h.

Standards

To be considered for admission to the College of Nursing, the applicant should have satisfactorily completed college coursework taken.

The American College Tests

All applicants for admission to The University of Iowa must complete the American College Tests. For information on the tests, write to the American College Testing Service, Box 451, Iowa City, Iowa 52240.

Selection Factors

Fulfillment of minimum admission requirements does not guarantee admission to the College of Nursing. From applicants who meet minimum requirements, the College's admission committee selects those who appear to be best qualified. The committee may require personal interviews. A physical examination is required prior to final admission.

Application Deadlines

Applications must be received by March 15 for the fall semester, June 15 for the spring semester and January 15 for the summer session.

Master of Arts

The University of Iowa Master of Arts program in nursing is accredited by the National League for Nursing. To receive this degree, nursing students must complete the requirements of the curriculum described below. The curriculum was in the process of revision when this *Catalog* edition closed; for that reason, requirements are not described down to the level of specific courses. More detailed information may be requested from the Graduate Program Office in the College of Nursing.

Degree Requirements

This 45-semester-hour curriculum will ordinarily require four semesters of full-time study for completion. Students must maintain a 2.5 minimum grade-point average, and must successfully complete a written, comprehensive examination.

The master's degree curriculum is structured into five components:

Advanced Nursing Core (15 s.h.): Coursework in the areas of conceptual and theoretical foundations for nursing (5 s.h.), leadership in nursing practice (5 s.h.), methods of nursing research (3 s.h.), and a professional seminar (2 s.h.).

Nursing Specialization (9 s.h.): Allows students to build a special area of knowledge and practice which extends beyond the advanced nursing core. Specialization may concentrate on the nursing of individuals—Child Health Nursing or Adult Health Nursing—or on the nursing of groups—Community/Family Health Nursing.

Students may focus their area of specialization through their choice of coursework and fieldwork experiences. For example, students selecting Adult Health Nursing as their area of specialization may choose experiences with patients in a long-term care facility, a mental health clinic, or a cardiac care unit. Students with unique career goals have the option of further modifying their plan of study under the direction of their academic adviser and with the approval of the graduate faculty.

Functional Skills (6 s.h.): Students may select among: administration, clinical practice, consultation, education, or research skill areas for additional study. Students electing to develop skills for a career in clinical practice will enroll for six hours of advanced clinical practice, which is in addition to courses required for their nursing specialization component.

Supporting Courses (9 s.h.): Students may choose to do their supporting coursework in an area related to their clinical specialization or career role interest. Relevance of these courses to their plan of study will be approved by the academic adviser.

Thesis (6 s.h.): All students are expected to write and successfully defend a thesis. This involves a systematic inquiry into a nursing problem to include such methodologies as historical research, case studies, analytical literature review, surveys, or experimental studies which meet the requirements of the Graduate College.

Admission as a Master's Candidate

Students should seek admission to the graduate program in nursing through direct application to the Graduate College of the University. Minimum requirements for admission to the Graduate College are: (1) completed application, (2) official transcript(s) from other institutions attended, (3) scores from the Aptitude Test of the Graduate Record Examination, (4) scores from the Test of English as a Foreign Language when appropriate, and (5) a minimum grade-point average of 2.5 for regular admission, 2.3 for conditional admission.

The College of Nursing additionally requires that the applicant:

Possess a baccalaureate degree with a major in nursing from a program accredited by the National League for Nursing;
Fulfill the legal requirements for the practice of nursing in at least one state in the United States;
Have an undergraduate grade-point average of 2.7 or a demonstrated ability to do graduate work for regular admission, a 2.5 for conditional admission;
Have recommendations from three persons familiar with his/her competency in the practice of nursing and potential for leadership and scholarship;
Submit the score from the Miller Analogies Test;
Submit a 600-word essay detailing career goals; and
Have successfully completed a basic statistics course.

Applications for master's degree candidacy are reviewed once a year for fall semester admission. The application deadline is March 15. By that time the admission committee will need all relevant admission materials, as listed above, in order to make a decision. Registration for coursework is possible in any term. However, initial enrollment in nursing courses which are offered sequentially takes place in the fall semester.

All regulations of the Graduate College pertaining to academic standing, probation and dismissal are applicable to graduate students in nursing. Transfer credits applicable to the master's degree program are limited, and must be approved by the dean for the graduate program in nursing and by the student's adviser.

Admission as a Professional Improvement Student

Some nurses may wish to take coursework at the University to fulfill the objective of professional or personal improvement only. Such individuals may request admission in the Professional Improvement category. This admission status will allow the student to take some graduate courses in the University without commitment to a degree objective.

Admission as a Professional Improvement student requires a formal application. This includes submission of three recommendations and all academic transcripts. Application deadlines are July 15 for admission in the fall semester, December 1 for admission in the spring semester, and May 1 for admission in the summer session.

Since acceptance as a Professional Improvement student has no direct bearing on acceptance as a master's candidate, Professional Improvement students are required to follow the application procedure described in the preceding section if they wish to seek admission as a master's degree candidate.

Continuing Education

The College offers nonacademic, short-term programs and special projects for registered nurses. They are scheduled both on and off campus. Continuing education units (CEUs) are awarded for each offering on the basis of one unit per ten hours of instruction.

Pediatric Nurse Practitioner Training Program

This four-month certificate program, offered jointly by the Department of Pediatrics of the College of Medicine and the College of Nursing, prepares registered nurses to function as pediatric nurse practitioners in an expanded role on child health care teams, in clinics and in private pediatricians' offices. Program requirements:

96:142 Seminar for Pediatric Nurse Practitioners 6 s.h.
70:100 Practicum for Pediatric Nurse Practitioners 3 s.h.

Clinical experience in the care of children is provided in The University of Iowa Hospitals and Clinics and under preceptors in the local setting. The program can be completed in one semester.

Admission

Applicants must be registered to practice professional nursing in Iowa (or be eligible for licensure by endorsement) and have one year of experience in child health care delivery. The general requirements for admission to the College of Nursing apply. Graduate students may enroll for the program as described either prior to or following the required courses in advanced nursing for children.

Facilities

The Nursing Building is centrally located on the University's main campus in close proximity to the colleges of Medicine, Pharmacy and Dentistry, University Hospitals, the Basic Science Building and the Health Sciences Library.

Completed in 1971, the Nursing Building consists of five floors with varied and specialized facilities. Administrative offices are located on the first floor. Faculty offices are located on every floor except the second, which is utilized entirely for classrooms, laboratories and the Learning Resource Center. Additional classrooms and laboratories are located throughout the building. Conference rooms, student lounges and meeting rooms are conveniently located. Research facilities in the building provide quick access to computing/calculating equipment and programmable minicomputers.

Courses

Undergraduate

96:20 Introduction to Health and Health Care Services 3 s.h.
Overview of health and health care services, with emphasis on concept and philosophy of health, various selected factors affecting health, current health care systems and trends in health delivery services.

96:30 Human Development and Behavior 3 s.h.
Developmental stages of human organism from conception through senescence; physiological, intellectual, emotional and social factors. Prerequisite: 31:1 or 31:3.

96:51 Nursing I 8 s.h.
Centers on the nursing process with primary emphasis on assessment; utilizing skills with measurement tools, observation and communication skills, establishment of effective nurse-patient relationships, increased self-awareness; students expected to make inferences concerning individual's or family's state of health, based on data collected; learning experiences occur in a variety of settings with families and individuals of varying ages and at differing stages of development and health. Prerequisite: admission to the College of Nursing.

96:80 Pathology 4 s.h.
Introduction to common physiological and psychological disorders of humans; emphasis on changes that occur in the human organism during illness and the methods used to correct these changes.

96:98 Management Concepts Applied to Nursing Practice 3 s.h.
Small group and individual learning experiences designed to facilitate application of management and sociological concepts to individual areas of practice. Directed to team-leaders, head nurses, supervisors, consultants, inservice staff. Not designed to meet the requirements in the nursing major.

96:100 Primary Care Nursing 8 s.h.
Theory and guided clinical practice in primary nursing care. Health screening of adults and children. Prerequisite: consent of instructor.

96:102 Nursing II 8 s.h.
Health promotion and disease prevention in individuals, families and groups; initiation and maintenance of health throughout life cycle considered in terms of basic human needs; emphasis on beginning interventions and evaluation skills; anticipatory guidance, counseling and continued assessment in a variety of settings. Prerequisite: Nursing I.

96:103 Nursing III 8 s.h.
Nursing intervention in crisis situations of acutely ill patients; emphasis on understanding effects of stress, coping, loss, homeostatic imbalance and other significant factors upon individuals whose pathological conditions precipitate crisis situation. Offered fall and spring only. Prerequisite: Nursing II.

96:104 Nursing IV 8 s.h.
Assisting adults and children in coping with health crises which have long-term implications; particular stress on nursing intervention and evaluation, working with individuals, families and groups in adapting life-styles to chronic health problems. Prerequisite: Nursing III.

96:105 Nursing V 8 s.h.
Leadership related to independent nursing practice and interdisciplinary collaboration; group process, decision making, teaching, strategies of persuasion, investigational skills, motivation for creativity and prescriptions for professional growth. Prerequisite: Nursing IV.

96:106 Historical, Philosophical and Social Foundations of Nursing 3 s.h.
Relationship of professional values and ethics, historical and legal factors to current nursing and health care issues and trends. Prerequisite: Nursing IV or permission of instructor.

96:110 Individual Study arr.
Supervised study and/or clinical practice adjusted to needs of student.

96:112 Human Sexuality 1-3 s.h.
Physiological and psychological aspects of human sexuality; parameters are defined by needs of the group. Same as 17:117, 42:112, 7C:112.

96:114 Family Dynamics 3 s.h.
Interaction patterns that occur within "normal" and "pathological" families; students expected to develop and implement a plan of intervention to help the family deal with a selected problem. Prerequisites: 96:102, 96:80.

96:115 Family Planning Dynamics 3 s.h.
Family planning and contraception with emphasis on cultural and socio-economic influences, psychological aspects, communication skills, and teaching-counseling skills. Prerequisite: 96:102.

96:116 Loss and Death in Clinical Nursing Practice 3 s.h.
Exploration of thoughts and feelings elicited in dealing with loss and death in the clinical nursing practice. Prerequisite: 96:102.

96:117 Basic Cardiac Life Support Instructors' Course 1 s.h.
Prepares students to teach the primary objectives of CPR skills to another audience; will advance students who have been certified previously as basic rescuers into higher category of instructor; provides instructor candidates with in-depth understanding of the material, knowledge of instructional methodologies, development of their ability to present material. Enrollment limited. Prerequisite: American Heart Association BCLS Certification as Basic Rescuer and instructor's approval.

96:118 Leadership in Groups 3 s.h.
Identification of various types and levels of groups, expansion of observational and interpretive skills of group members' behaviors and interactions, recognition and utilization of various group dynamics, development of beginning skills in leading groups, utilization and evaluation of helpful group leader operations and assessment of one's own level functioning within a group. Prerequisite: 96:103.

96:129 Introduction to Gerontology 3 s.h.
Interdisciplinary course focusing on an overview of the concept of aging with emphasis on theories, resources and challenges of aging and implications for practice. Prerequisite: senior standing (by hours) or consent of instructor.

96:131 Institute Geriatric 2-3 s.h.
Analysis of the needs of the institutionalized gerontological client and implementation of nursing care to meet those needs. Prerequisite: 96:102.

96:132 Nursing Care of the Hospitalized Orthopaedic Patient 3 s.h.
Pathophysiological conditions and treatment of the hospitalized orthopaedic patient; nursing process involved in helping the individual and family cope with the existing health problem. Prerequisite: 96:103.

96:133 Nursing Care of the Adult Experiencing Surgery 3 s.h.
In-depth study of knowledge and skills needed in planning and caring for patients who are experiencing surgical interventions, with focus on the preoperative, intraoperative and postoperative periods. Prerequisite: 96:103.

96:134 Sensory Deprivation 3 s.h.
Formulation of the concept of sensory deprivation with application to clinical setting in the care of patients to prevent or decrease effects of sensory deprivation. Prerequisite: 96:103.

96:135 Acute Cardiac Nursing 3 s.h.
In-depth study of the knowledge and skills needed to provide care for patients who have experienced an acute cardiac insult with emphasis on assessment of cardiac status, medical treatment of various cardiac dysfunctions and rehabilitation aspects. Prerequisites: 96:103, 96:136.

96:136 Interpretation of Cardiac Arrhythmias 1 s.h.
Introduction to the knowledge and skills necessary for anticipating, recognizing and treating various cardiac arrhythmias. Prerequisite: 96:102.

96:137 Oncology Nursing 3 s.h.
Development of knowledge and skills in caring for the patient with cancer with emphasis on incidence, etiologies and the underlying pathological processes of cancer, the diagnostic method, treatment modalities and prevention of complications. Prerequisite: 96:103.

96:139 Nursing Care of Adult Patients with Altered Levels of Awareness 3 s.h.
In-depth study of knowledge and skills needed in assessing and caring for patients with altered levels of awareness due to physiological disturbances. Prerequisite: 96:103.

96:141 Genetic or Other Developmental Disabilities 3-4 s.h.
Study of knowledge related to genetics and birth defects; utilization of this knowledge along with knowledge of family dynamics, growth and development, counseling, anticipatory guidance and community resources in working with families who have a child with genetic or other birth defects. Prerequisite: 96:104.

96:142 Seminar: Pediatric Nurse Practitioners arr.

96:143 The Newborn Infant—Growth, Development and Care 3 s.h.
In-depth study of the knowledge and skills needed for the care of the newborn from conception to six weeks, with emphasis on the high-risk newborn. Prerequisites: 96:102, 96:80.

96:144 Nursing Care of the Expectant Family 3 s.h.
Focus on prenatal family and the knowledge and skills needed in anticipating and meeting health needs of these individuals. Prerequisite: 96:102.

96:145 Intrapartum Nursing 3 s.h.
In-depth study of the knowledge and skills needed for nursing management of a patient during the intrapartum period. Prerequisite: 96:103.

96:152 Use of Literature in Psychiatric Nursing Intervention 3 s.h.
Familiarization with how a variety of psychiatric, emotional and related problems are portrayed in the literature of psychiatry, and comparison of these presentations to the "real world," with emphasis on using literature in the emotional care of patients. Prerequisites: 96:103.

96:154 Theory and Nursing Intervention for Individuals with Depression Including Suicidal Intention and Attempts 3 s.h.
Theoretical viewpoints related to depression and suicide and how these relate to and influence nursing care provided. Prerequisite: 96:103.

96:156 Nursing Care of Adult Individuals Exhibiting Bizarre Behavior 3 s.h.
Theoretical background on personality dynamics as they are impaired in individuals exhibiting bizarre behavior, and development of nursing interventions to deal with this disturbed behavior. Prerequisite: 96:103.

96:158 Nursing Care of the Alcoholic Patient 3 s.h.
Prevention, assessment, and treatment of alcohol abuse; emphasis on community resources, legislation, current research findings, cultural and personal values, and the impact of alcohol on the human organism; emphasis also placed on working with individuals, families, and community groups at effecting change in dysfunctional life styles. Prerequisite: 96:102, 96:80, or permission of instructor.

96:172 Health and Cultural Diversity 3 s.h.
Cultural diversity refers to the overt and covert differences among people of different population groups with respect to their values, beliefs, language, physical characteristics, and general patterns of behavior; overview of the dynamics of health and illness in cross-cultural perspective. Prerequisite: 96:103, or junior standing in Department of Anthropology. Same as 113:108.

96:174 Anthropological Perspectives on Mental Health 3 s.h.
Survey of cross-cultural perspectives on mental health and mental illness; examination of expected behavioral patterns for different developmental ages in various cultures, as well as deviance from these patterns. Prerequisites: 96:103, or junior standing in Department of Anthropology, or permission of instructor. Same as 113:107.

96:184 Public Health Nursing 3 s.h.
Knowledge and skills needed to provide nursing care in a community agency or setting with emphasis on epidemiology, family service and community resources. Prerequisite: 96:104.

96:186 Home Care Planning and Coordination 3 s.h.
Nursing process as it relates to predischarge planning of home care for clients in primary care setting with emphasis on interdisciplinary and intradisciplinary communications and coordination of resources to meet health needs. Prerequisite: 96:104.

Graduate

(See Graduate Program Office for revised course listings completed following publication of this *Catalog*.)

96:200 Conceptual and Theoretical Foundations for Nursing I 3 s.h.

96:204 Leadership in Nursing Practice 3 s.h.

96:206 Professional Seminar: Issues in Nursing 2 s.h.
Identification, exploration, and analysis of contemporary issues and trends in nursing.

96:210 Methods of Research in Nursing 3 s.h.
Specific research approaches, methods of data collection, and problems of measurement of variables, approaches to data analysis, critical synthesis and analysis of nursing research. Prerequisite: a basic statistics course.

96:214 Group Care Services for Children: The Need for Standards and Licensing 3 s.h.
Interdisciplinary seminar to examine historical, legal and protective considerations in standards for out-of-home care, including health, safety, nutrition, development, and educational needs of children. Same as 17:214, 42:214, 7E:214.

96:215 Interdisciplinary Approaches to Serving Vulnerable Children and Their Families 3-4 s.h.
Interdisciplinary seminar focusing on identification of at-risk groups in the population and on prevention, assessment and management of selected situational and developmental crises predicted to interfere with children's development. Permission of one of the instructors required. Same as 17:215, 42:215, 7E:215.

96:216 Group Leadership in Human Sexuality 0-3 s.h.

96:220 Nursing Research 2 s.h.
Analysis and critical appraisal of nursing theories and nursing research; data analysis; completion of research proposal. Prerequisites: 96:210 and statistics.

96:222 Advanced Concepts of Child Health Nursing I 3 s.h.

96:226 Advanced Concepts of Adult Health Nursing I 3 s.h.

96:230 Biophysiological Concepts in Advanced Nursing 3 s.h.
Concept of the normal human cell relating cellular function and structure to other concepts operating in humans.

96:231 Biophysiological Concepts in Advanced Nursing 3 s.h.
Continuation and expansion of 96:230 to include pathological concepts operating in the behavioral signs and symptoms of humans. Prerequisite: 96:230.

96:232 Advanced Medical-Surgical Nursing I 6 s.h.
Analytical, conceptual approach to care of medical-surgical patients utilizing findings from natural, behavioral and applied sciences; clinical experience in testing nursing interventions.

96:233 Advanced Medical-Surgical Nursing II 6 s.h.
Continuation of 96:232, which is prerequisite.

96:234 Advanced Concepts of Community - Family Health Nursing I 3 s.h.

96:242 Advanced Nursing of Children I 6 s.h.
Growth and development of child; philosophies of child care; health promotion and anticipatory guidance; experience provided with well children in a variety of settings. Fall.

96:243 Advanced Nursing of Children II 4 s.h.
Children's responses to illness and hospitalization; care of ill child in a variety of settings; nursing responsibilities in facilitating optimum health care for children. Spring semester only after 1977. Prerequisite: 96:242.

96:244 Advanced Nursing of Children III 2-4 s.h.
Individually planned experiences requiring application of knowledge in a selected functional area. Fall. Prerequisite: 96:243.

96:245 Special Project Nursing of Children 2 s.h.
Project in a substantive area in nursing of children. Prerequisite: 96:242.

96:250 Theory Foundations of Mental Health Nursing 3 s.h.
Theories and concepts of mental health and mental illness, treatment modalities and applications of these in mental health nursing practice. Offered each fall and occasional summers. Prerequisite: consent of instructor.

96:251 Nursing Intervention with Individual Adjustive Behavior 3 s.h.
Psychosocial assessment, nursing intervention and evaluation of intervention processes focusing on individuals

exhibiting maladaptive psychosocial behaviors. Offered each fall and occasional summers. Prerequisite: consent of instructor.

96:252 Nursing Intervention and Families **3 s.h.**
Assessment of family dynamics, nursing intervention and evaluation of intervention in disturbed family networks. Fall, spring, summer. Prerequisite: consent of instructor.

96:253 Nursing Intervention in Groups **3 s.h.**
Group dynamics, group process and psychopathology in nursing intervention with groups of people. Fall, spring. Prerequisite: consent of instructor.

96:254 Seminar Issues in Mental Health Nursing **1 s.h.**
Exploration of trends and issues related to nursing practice. Offered each fall and occasional summers. Prerequisite: 6 s.h. of mental health nursing.

96:255 Mental Health Nursing Practicum—Select Population **arr.**
Study and selected practicum experiences relating to nursing intervention with selected age groups, stigmatized groups, or communities. Fall, spring, summer. Prerequisite: 6 s.h. of advanced nursing and consent of instructor.

96:256 Consultation in Mental Health Nursing **arr.**
Study of consultation theories and process. Experience in method selection and application for selected population groups and settings. Prerequisite: consent of instructor.

96:257 Mental Health Nursing Practicum—Interventive Modalities **arr.**
Focused study upon application of nursing theory utilizing a specific interventive technique with individuals, families or groups. Fall, spring, summer. Prerequisite: introductory course related to the proposed experience and consent of instructor.

96:258 Practicum in Teaching Mental Health Nursing **arr.**
Study and application of learning theory, nursing theory and teaching strategies as applied to mental health concepts. Fall, summer. Prerequisite: 6 s.h. of advanced mental health nursing and consent of instructor.

96:259 Nursing Intervention, Community Social Systems **arr.**
Study of community development, social systems, selected problems and mental health treatment modalities, their effects upon adjustive behavior. Fall, spring. Prerequisite: 6 s.h. of advanced mental health nursing and consent of instructor.

96:260 Nursing Service Administration I **3 s.h.**
Administrative concepts and organizational theory central to understanding administration in a complex modern community hospital; small group discussion using case method of studying nursing administration.

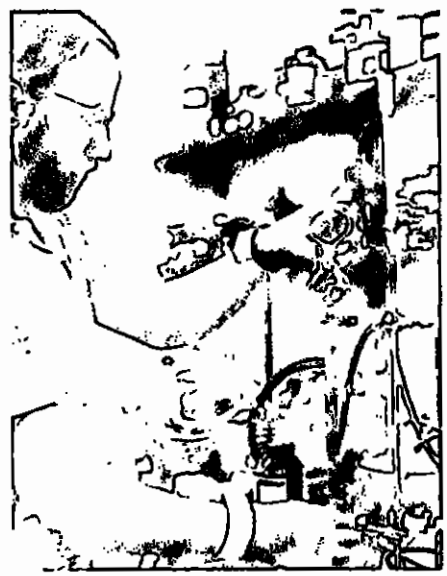
96:261 Nursing Service Administration II **5 s.h.**
Functions of nursing department and nursing director in complex health care setting; group discussion of nursing administration cases and analysis of action alternatives. Prerequisite: 96:260.

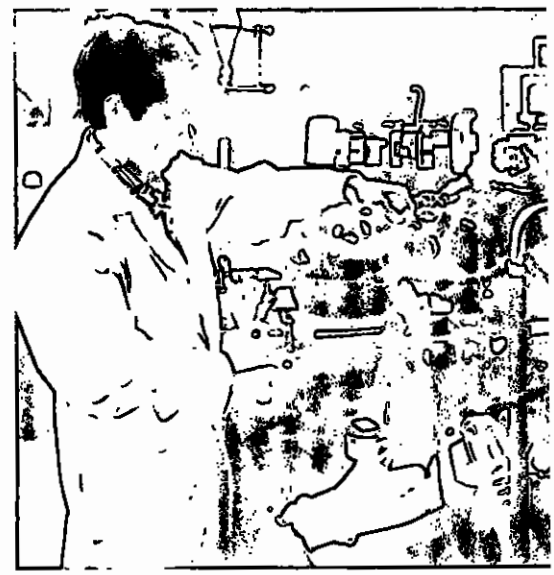
96:262 Nursing Service Administration III **5 s.h.**
Continuation of 96:261.

96:268 Clinical Nursing I **3 s.h.**
Designed for nursing care generalist; explores nature of nursing knowledge and provides opportunity for analyses of nursing problems in clinical settings.

96:269 Clinical Nursing II **3 s.h.**
Continuation of 96:268, which is prerequisite.

96:299 Thesis **arr.**





College of Pharmacy

Dean: Dale E. Wurster
Dean emeritus: Louis C. Zopf
Associate dean, director of pharmaceutical services. John L. Lach
Assistant dean for graduate affairs. Joseph G. Cannon
Assistant dean for undergraduate affairs. David P. Carew
Head, division of Medicinal Chemistry-Natural Products. John P. Rosazza
Head, Division of Pharmaceutics: Eugene L. Parrott
Head, Pharmaceutical Socioeconomics and Continuing Education: G. Joseph Norwood
Director, Pharmacy Continuing Education: Michael C Shannon
Coordinator, Pharmacy Continuing Education: Wendle L Kerr
Head, Division of Clinical-Hospital Pharmacy: Dennis K. Helling
Coordinator, Clinical Pharmacy Education. Paul J. Perry
Coordinator, Hospital Pharmacy Education: C. Douglas Hepler
Faculty: *professors* Charles F. Barfknecht, Joseph G Cannon, David P. Carew, J. Keith Guillory, John L. Lach, G Joseph Norwood, Eugene L. Parrott, John P Rosazza, Dale E. Wurster, Louis C. Zopf
associate professors Ting-Fong Chin, Douglas R. Flanagan, Wendle L. Kerr
assistant professors Harold J. Black, James F. Caputo, Robert W. Dick, Dennis K. Helling, Leslie S. Hendeles, C. Douglas Hepler, Lloyd E. Matheson, Jr., Paul J. Perry, Randall A. Prince, Michael C. Shannon
clinical assistant professors Bruce Alexander, Michael M. Alexander, Michael R. Alexander, Stephen Bergquist, Kenneth Breslow, David Carlson, Allen Ellsworth, Arthur C. Hedges, Mark E. Jones, Richard Leff, Hazel M. Seaba, Dale F. Smith, Jerry W. Taylor, Richard Theobald, Jan Wenger, David Wenning
clinical instructors Bernard Cremers, Charles S. Dayton, Dennis Elbert, Steven Kastendieck, Alan Mustion, John G. Rose, Michael Slagle, John A. Walker III
Degrees offered: B.S.Ph., M.S., Ph.D.

The pharmaceutical sciences are concerned with the preparation and dispensing of medicinal products and monitoring their activity. The pharmacist is also trained to identify, analyze, select, combine and standardize these medicines, and serves his or her community as a prime source of information on health topics.

Although he or she performs a variety of tasks in and out of the community pharmacy, the pharmacist is basically a specialist in the science of drugs. He or she must understand their composition, chemical and physical properties, manufacture and uses, and activity in the normal individual as well as in the ill patient, and must be familiar with tests for the strength, purity and efficacy of drug products. The pharmacist is prepared to compound and dispense prescriptions written by health practitioners, who rely on the pharmacist for information about various drugs, their availability, activity, toxicology, contraindications, etc.

Nearly everyone is familiar with the community pharmacist and the pharmacy in which he or she practices. The size and type of practice may vary—community pharmacies may be large or small, operated by individuals or by corporations. The pharmacists who staff these pharmacies make up the majority of practitioners. Over 100,000 men and women practice in community pharmacies.

Another smaller group of pharmacists is employed in hospital pharmacy work. The government also employs pharmacists in the Public Health Service, Veterans Administration, Food and Drug Administration, and armed forces.

Pharmaceutical industry is also an area where numerous pharmacists are employed. This includes pharmaceutical manufacturing, where pharmacists are found in various areas of research, development, manufacturing, control, marketing and advertising. In addition to these pharmacists, numerous others are employed in pharmaceutical sales. Pharmacy training is especially valuable to these men and women who are responsible for acquainting physicians, dentists, veterinarians and other pharmacists with drug products.

In the United States more people are receiving total health care than ever before. This expansion of health care will continue. Young men and women in pharmacy will face new challenges, expanded responsibilities, and an ever-increasing growth in opportunities.

Undergraduate Program

Students in the College of Pharmacy are in a Bachelor of Science program, and they receive professional training and education in a number of areas. These include pharmacy technology, biopharmaceutics, medicinal chemistry and natural products, pharmaceutical socioeconomics, clinical and hospital pharmacy.

The colleges of Liberal Arts, Business Administration, Law and Medicine contribute to the education of pharmacy students by providing instruction in the physical sciences, basic medical sciences, business, law and humanities.

Basically, the Bachelor of Science program in pharmacy consists of one year of pre-pharmacy study, taken in the College of Liberal Arts at Iowa or in any accredited community or liberal arts college, and four years of pharmacy studies.

It is possible to transfer into the College of Pharmacy after two years of college-level work at an approved institution. A student entering the College after two years of preprofessional study can complete the professional program in three years if the preprofessional study includes, in addition to the basic preprofessional requirements, at least eight semester hours of organic chemistry, from five to eight semester hours of biology or zoology, three or four semester hours of economics and three to four semester hours in quantitative analysis.

The University of Iowa College of Pharmacy is accredited by the American Council on Pharmaceutical Education. Graduates of the College are qualified to take the licensure examination given by the Iowa Board of Pharmacy Examiners.

The professional curriculum includes a minimum of 18 semester hours of electives; eight of these must be taken in the fourth professional year. By choosing appropriate electives, the student may focus on such special areas as clinical or hospital pharmacy or pregraduate study.

The Professional Curriculum

First Year

First Semester

46:13 Pharmacy Math	3 s.h.
37:3 Principles of Animal Biology	5 s.h.
4:121 Organic Chemistry I	3 s.h.
4:101 Elementary Quantitative Analysis	4 s.h.
Total	15 s.h.

Second Semester

46:14 Pharmacy: Orientation	2 s.h.
6E:1 Principles of Economics	4 s.h.
4:122 Organic Chemistry II	3 s.h.
4:141 Intermediate Chemistry Laboratory I	2 s.h.
* 60:102 Principles of Human Anatomy	3 s.h.
**Elective	3 s.h.
Total	17 s.h.

*Also offered first semester for students on a 2-3 program only.

**18 semester hours of electives are required, of which at least eight must be taken in the P-4 year.

Second Year

First Semester

46:23 Pharmaceutics I	4 s.h.
99:162 Biochemistry for Pharmacy Students	4 s.h.
61:157 General Microbiology	4 s.h.
*60:102 Principles of Human Anatomy	3 s.h.
Total	15 s.h.

Second Semester

46:24 Pharmaceutics II	4 s.h.
46:22 Pharmaceutical Socioeconomics	4 s.h.
46:128 Medicinal Chemistry: Natural Products I	4 s.h.
72:150 Intermediate Physiology	4 s.h.
Total	16 s.h.

*May be taken in second semester of first year.

Third Year

First Semester

46:131 Medicinal Chemistry: Natural Products II	4 s.h.
69:203 Principles of Human Pathology	4 s.h.
71:101 Pharmacology for Health Sciences: Pharmacy	5 s.h.
46:35 Pharmaceutical Socioeconomics	3 s.h.
Total	16 s.h.

Second Semester

46:132 Medicinal Chemistry: Natural Products III	4 s.h.
71:103 Pharmacology and Toxicology	3 s.h.
46:38 Pharmaceutics III	3 s.h.
46:110 Clinical Pharmacy: Case Study	3 s.h.
Elective	3 s.h.
Total	16 s.h.

Fourth Year

First Semester

46:41 Jurisprudence	2 s.h.
46:43 Pharmaceutics IV	4 s.h.
*46:60 Clinical Pharmacy: Community Pharmacy	2 s.h.
*46:61 Clinical Pharmacy: Drug Information	2 s.h.
46:111 Clinical Pharmacy: Therapeutics I	2 s.h.
**Electives	4-6 s.h.
Total	16-18 s.h.

Second Semester

*46:60 Clinical Pharmacy: Community Pharmacy	2 s.h.
*46:61 Clinical Pharmacy: Drug Information	2 s.h.
46:112 Clinical Pharmacy: Therapeutics II	2 s.h.
**Electives	6-8 s.h.
Total	12-14 s.h.

*May be taken in either semester.

**A minimum of 8 s.h. of electives must be taken in the P-4 year.

Professional Electives

46:47 Introduction to Research Methods	3 s.h.
46:48 Community Pharmacy Operations	2 s.h.
46:50 Pharmaceutical Chemistry: Drug Analysis	3 s.h.
46:52 Senior Seminar	1 s.h.
46:56 Non-Prescription Drugs	2 s.h.
46:62 Clinical Pharmacy: Family Practice Therapeutics	2 s.h.
46:63 Clinical Pharmacy: Pediatric Allergy	2 s.h.
46:64 Hospital Pharmacy: Radiopharmacy	2 s.h.
46:65 Clinical Pharmacy: Surgical Therapeutics	3 s.h.
46:69 Clinical Pharmacy: Elective Clerkship	1-8 s.h.
46:101 Pharmacy: Projects	1- 3 s.h.
46:103 Physical Pharmacy	3 s.h.
46:104 Biopharmaceutics	3 s.h.
46:105 Industrial Pharmacy: Survey	2-3 s.h.
46:107 Hospital Pharmacy: Survey	3 s.h.
46:108 Hospital Pharmacy: Survey	3 s.h.
46:114 Advanced Clinical Pharmacy	4 s.h.
46:120 Clinical Pharmacy: Psychotherapeutics	4 s.h.
46:138 Introduction to Natural Product Research	1-2 s.h.
46:154 Communications Skills for Pharmacists	3 s.h.

Graduation from the baccalaureate program in pharmacy requires the student to complete satisfactorily the required courses in addition to 18 semester hours of electives and to achieve a minimum grade-point average of 2.0 for all work undertaken.

For rules and regulations concerning academic probation, pass-fail, credit by examination, maximum schedule, second-grade-only option, waiver or substitution of courses, cancellation of registration, drop date and correspondence study, see the "College of Pharmacy" section in the current *Schedule of Courses.*

Admission

The college-level work outlined below is the minimum academic requirement for admission to the College of Pharmacy:

Rhetoric: eight semester hours, or six hours of transfer credit in English composition and rhetoric, and two hours in speech;
General chemistry: eight semester hours;
Mathematics: three semester hours equivalent to analytic geometry or a higher mathematics course;
Physics: a one- or two-semester course in basic physics (at Iowa, 29:8 Basic Physics). A one-year animal biology or zoology course may be taken instead; physics will then be taken in the first professional year.

Students who have minor deficiencies in meeting the above requirements may be admitted to the College upon recommendation of the Chair of the Admissions Committee and the approval of the Dean.

The applicant must have earned a 2.0 (A=4) cumulative grade-point average on all college work attempted.

Fullfilment of the specific requirements for admission listed above does not ensure admission to the College of Pharmacy. From applicants meeting the requirements, the admissions committee of the College selects the best qualified applicants.

Transfer Students

Students who transfer into the College after two years in a community or liberal arts college can complete the pharmacy program in three years if they have satisfactorily completed courses in organic chemistry, biology or zoology, economics and quantitative analysis. Students who plan to remain in a community college for two years before transferring to the College should consult the Dean of the College concerning course requirements.

Transfer with Advanced Standing

Students transferring from other colleges of pharmacy accredited by the American Council on Pharmaceutical Education receive credit toward the Bachelor of Science degree in pharmacy for satisfactorily completed coursework required in this curriculum. However, at least one academic year (30 semester hours) of residence in the University of Iowa College of Pharmacy is required for the degree.

Students transferring from nonpharmacy colleges may receive credit for work required in the Bachelor of Science curriculum in pharmacy, but still must expect to be enrolled for at least three years in the College of Pharmacy.

A minimum grade of C is required for work applied by transfer toward the pharmacy degree.

Graduate Programs

The College has active graduate programs in several areas. Master of Science and Doctor of Philosophy programs are available in pharmaceutics, medicinal chemistry-natural products, and pharmaceutical socioeconomics. A Master of Science degree is available in clinical-hospital pharmacy.

Advanced study in the pharmaceutical sciences prepares the student for opportunities in research, teaching and administrative positions in the pharmaceutical, chemical and agricultural chemical industries, in colleges and universities, in government agencies and in a number of health-related institutions and organizations.

The application deadlines and the requirements for grade-point average, GRE score and necessary letters of recommendation are the same as those established by the Graduate College.

Facilities

The Pharmacy Building is located in the Health Center complex on the University's main campus, in close proximity to the colleges of Medicine, Nursing and Dentistry, University Hospitals, the Basic Sciences Building and the Health Sciences Library.

The Pharmacy Building is a five-story structure especially designed to provide modern facilities for a comprehensive program of pharmacy education. In addition to classrooms, an auditorium and learning resources center, the building houses well-equipped separate laboratories and a greenhouse for instruction at the undergraduate and graduate levels.

The College's extensive industrial pharmacy laboratory serves as a teaching unit as well as a service division of the College. Here undergraduate and graduate students have the opportunity to learn methods of large-scale pharmaceutical product development.

In the Clinical Pharmacy program, students work with other health professionals and have the opportunity to monitor drug therapy in hospitalized and non-hospitalized patients, under the supervision of clinical instructors in pharmacy and medicine. Among the various clerkships in which the students are involved are many areas of the University and Veterans Administration hospitals; the family practice clinics at Oakdale, Mechanicsville, and Williamsburg; the Iowa Medical Security Facility; Iowa City Mercy Hospital; Cedar Rapids Mercy Hospital; selected community pharmacies and nursing homes; the Iowa Drug Information Service; and the College of Pharmacy's Department of Pharmaceutical Services.

Courses

Undergraduate Pharmaceutics

46:13 Pharmacy: Math **3 s.h.**
Application of systems of weights and measures and mathematical calculations involved in pharmaceutical procedures and practices; includes introductory lectures in calculus and its application to pharmaceutical problems.

46:14 Pharmacy: Orientation **2 s.h.**
Ethics, organization and development of the science and profession of pharmacy.

46:23 Pharmaceutics I **4 s.h.**
Lecture and laboratory on particle size measurement, characteristics of small particles, properties of solids; formulation, preparation and evaluation of solid dosage forms. Prerequisites: 46:13, 4:122, 29:8.

46:24 Pharmaceutics II **4 s.h.**
Lecture and laboratory on application of physical and chemical laws to the formulation and preparation of liquid dosage forms, including solutions, colloids and emulsions. Prerequisite: 46:23.

46:38 Pharmaceutics III **3 s.h.**
Fundamentals of drug absorption and physiological and pharmaceutical factors affecting drug absorption; effect of product design and manufacture on drug availability and on product selection; drug reactions and interactions. Prerequisites: 46:24 and 71:101.

46:43 Pharmaceutics IV **4 s.h.**
Lecture and laboratory on availability of drugs; various dosage forms such as solids, solutions and disperse systems with emphasis on ophthalmic, nasal and otic solutions and on the administration of drugs via the lungs; laboratory emphasizes patient record systems, techniques of compounding and dispensing and recognition of drug interactions. Prerequisite: 46:38.

Graduate Pharmaceutics

46:101 Pharmacy: Projects **1-3 s.h.**
Basic and applied research problems of pharmaceutical significance. Prerequisite: P-2 or above standing, open to graduate students.

46:103 Physical Pharmacy **3 s.h.**
Surface and interfacial phenonomena, adsorption and solubilization in pharmaceutical systems.

46:104 Biopharmaceutics **3 s.h.**
Mechanism of drug absorption and interrelationships among properities of pharmaceuticals, dosage forms and pharmacodynamic effects. Prerequisite: graduate standing or consent of instructor.

46:105 Industrial Pharmacy: Survey **2-3 s.h.**
Organization, challenge and unit operations in production of pharmaceuticals. Prerequisite: 46:24.

46:202 Pharmacy: Selected Topics **2 s.h.**
Recent advances and contemporary research in pharmaceutics. May be repeated for credit.

46:206 Stability of Pharmaceuticals **3 s.h.**
Mechanisms of degradation of pharmaceuticals; prediction of shelf-life of pharmaceuticals, stabilization; offered alternate summers. Prerequisite: 4:132.

46:221 Quality Control **3 s.h.**
Lecture and laboratory; collection and interpretation of analytical data; instrumental analysis as applied to pharmaceutical quality control; separation techniques.

46:225 Product Development 3 s.h.
Application of physiochemical and physiological principles to formulation and design of pharmaceutical dosage forms.

46:226 Product Development 3 s.h.
Continuation of 46:225.

46:229 Advanced Biopharmaceutics 2 s.h.
Effect of physical-chemical properties and pharmaceutical manipulations on drug availability considered; emphasis on rate of release from various dosage forms and formulations. Prerequisites: 22M:25, 4:132.

46:231 Pharmacy: Seminar 0-1 s.h.
Reports on literature readings and on research being conducted in pharmaceutical sciences. Required of all pharmaceutics graduate students. May be repeated.

46:233 Pharmacy: Research arr.

46:235 Physical Pharmacy 3 s.h.
Continuation of 46:103. Prerequisite: 46:103.

Undergraduate Medicinal Chemistry: Natural Products

46:50 Pharmaceutical Chemistry: Drug Analysis 3 s.h.
Theory and application of modern instrumental procedures for assay of medicinal agents; specific emphasis on chemical, physical, biological, and instrumental techniques. Prerequisite: consent of instructor.

46:58 Non-Prescription Drugs 2 s.h.
Consumer-oriented information about nonprescription drugs and other pharmacologically active substances; open to nonpharmacy students except freshmen; open to pharmacy students only on pass/fail basis.

46:128 Medicinal Chemistry: Natural Products I 4 s.h.
First of a three-semester sequence; lectures and laboratory on organic and inorganic medicinal and therapeutic agents of natural and synthetic origin; physical and chemical properties, as they relate to medicinal and therapeutic effects; comparative biological activity and toxicity; detoxication mechanisms; functional group chemistry; nomenclature; chemistry of radiodiagnostic and therapeutic agents; introduction to biopharmaceutical analysis. Prerequisites: 4:122, 99:162 or equivalent, 81:157 or equivalent.

46:131 Medicinal Chemistry: Natural Products II 4 s.h.
Continuation of 46:128 which is prerequisite.

46:132 Medicinal Chemistry: Natural Products III 4 s.h.
Continuation of 46:131 which is prerequisite.

46:138 Introduction to Natural Product Research 1-2 s.h.
An elective laboratory course designed to give students in-depth exposure to techniques and problems encountered in natural product research. Prerequisites: 46:132 and consent of instructor.

Graduate Medicinal Chemistry: Natural Products

46:150 Synthetic Strategy in Medicinal Chemistry 3 s.h.
Lectures, assigned readings, and discussion of special relevance to medicinal chemistry and in drug design. Prerequisites: 4:122, 46:132.

46:201 Perspectives in MCNP Research 1 s.h.
Discussion of contemporary research in the areas of medicinal chemistry and natural products, with particular emphasis on current faculty interests. Prerequisite: acceptance into Medicinal Chemistry and Natural Products graduate program.

46:205 Stereochemistry and Conformational Analysis 2 s.h.
Basic concepts of conformational analysis; recent selected references on subject; application of this science to design and synthesis of biologically active molecules. Prerequisite: 4:172.

46:207 Spectrometric Interpretation 2-4 s.h.
Interpretation of ultraviolet, infrared, nuclear magnetic resonance, optical rotatory dispersion and mass spectrometric data; discussion of correlation of combined data and application to medicinal chemical research.

46:211 Heterocycles 3 s.h.
Discussion, primarily from current literature, of selected heterocyclic ring systems of medicinal importance; special reference to synthesis, mechanisms and stereochemistry as related to biological effects. Prerequisites: 46:205, 4:172.

46:212 Aspects of Receptor Site Theory 3 s.h.
Applications of modern chemical theory to molecular level interactions of endogenous and exogenous organic molecules with receptor sites on macromolecules; discussion from current literature. Prerequisites: 46:205, 46:132 or equivalent, 71:101 or equivalent; biochemistry or consent of instructor.

46:215 Medicinal Chemistry: Survey 3 s.h.
Discussions from current literature of applications of modern theoretical organic chemistry to study and understanding of biological phenomena; chemical and stereochemical aspects of autonomic nervous system and chemical agents influencing it. Prerequisites: 46:132, 71:101 or consent of instructor.

46:217 Medicinal Chemistry: Natural Products Research arr.

46:219 Phytochemical Methods 3 s.h.
Occurrence, distribution, isolation of primary and secondary natural products; techniques of handling and storing biological materials; emphasis on methods of isolation, including biological and phytochemical screening.

46:220 Antibiotics 2 s.h.
Discussion of most commonly employed antibiotics, covering history, production, methods of isolation and purification, physical and chemical properties, biosynthesis, methods of assay, mechanism of action, resistance, uses. Prerequisite: consent of instructor.

46:222 Biogenesis and Biotransformations 3 s.h.
Biogenetic and biodegradative pathways of natural products and xenobiotics (alkaloids, steroids, acetogenins, aromatics, glycosides). Microbial transformations covering: microbial chemistry; fermentation type-reactions (hydroxylations, dealkylations and dehydrogenations) and methodology. Prerequisite: consent of instructor.

46:223 Theoretical Medicinal Chemistry 3 s.h.
Fundamental physical chemical concepts of structure and reactivity applied to organic medicinal agents. Prerequisites: 4:132, 46:207.

46:227 Medicinal Chemistry: Natural Products Seminar 0-1 s.h.

46:230 Selected Topics in Medicinal Chemistry: Natural Products 1-3 s.h.
Discussion of research reports of recent advances in field of natural products. Prerequisite: consent of instructor.

Undergraduate Pharmaceutical Socioeconomics

46:22 Pharmaceutical Socioeconomics 4 s.h.
Overview of social and economic problems associated with the delivery of health care and pharmaceutical services in the United States, and the socioeconomics of drugs and pharmaceutical services in industrial, institutional, and community practice. Prerequisite: 6E:1 or 6E:2.

46:35 Pharmaceutical Socioeconomics 3 s.h.
Information on procedures necessary for good management of human and financial resources in pharmaceutical organizations; case-study approach is used to give the student the opportunity to apply principles to real-life situations.

46:41 Jurisprudence 2 s.h.
Overview of legal systems in the United States with emphasis on contracts, torts and related areas of civil law; in-depth study of federal food, drug and cosmetic law, federal laws regulating narcotics and other dangerous drugs; discussion of state and federal laws regulating pharmacy practice and drug distribution.

46:47 Introduction to Research Methods 3 s.h.
The nature of scientific inquiry; experimental and quasi-experimental designs; operational definitions; constructs; methods of data collection; applications in health services research. Consent of instructor. Preference given to students having introductory statistics.

46:48 Community Pharmacy Operations 2 s.h.
Practical problems encountered by managers of community pharmacy operations; topics include starting a community pharmacy, purchasing and distribution, advertising and franchising; case-study method is used. Prerequisite: 46:35 or consent of instructor.

46:52 Senior Seminar 1 s.h.
Seminar discussions of current social and economic problems affecting pharmacy practice. Prerequisite: senior standing.

46:154 Communications Skills for Pharmacists 3 s.h.
Elective; basic concepts and processes for effective communication between pharmacists and patients. Prerequisites: P3 standing and consent of instructor.

Graduate Pharmaceutical Socioeconomics

46:121 Drug Development and Marketing 3 s.h.
Problems inherent in developing new pharmaceutical products discussed; lectures focused on new product generation from source of idea through placement of product on market; coordination between research and management emphasized. Prerequisite: consent of instructor.

46:122 Pharmaceutical Economics and Marketing 4 s.h.
Analysis of economic and marketing environment of pharmaceutical industry; discussion of concentration ratios, elasticity of demand, risk, prescriber motivation and other factors influencing pharmaceutical economics and marketing, with frequent references to governmental investigations of the industry. Prerequisite: consent of instructor.

46:213 Pharmaceutical Socioeconomics: Seminar 0-1 s.h.
Assigned readings and discussion of recent research in pharmacy administration; may be repeated.

46:251 Pharmaceutical Socioeconomics: Research arr.

46:253 Pharmaceutical Socioeconomics: Research Methods 3 s.h.
Scientific approaches to the solution of problems in pharmacy administration; emphasis on research problems, design and their relationship. Prerequisite: 22S:102 or equivalent. Corequisite: 7P:242 or 6E:182.

46:254 Pharmaceutical Socioeconomics: Health Economics 3 s.h.
Analysis of supply and demand of health resources and influence of third-party payment on medical care utilization discussed; cost-benefit analysis of health programs and manpower considerations in health sciences emphasized; pharmacy considered in its relationship to health care system.

Undergraduate Clinical-Hospital Pharmacy

46:60 Clinical Pharmacy: Community Pharmacy 2 s.h.
Required; conducted primarily in community pharmacies; emphasizes communication skills with practicum and didactic education in non-perscription drug use. Prerequisites: 46:110, P4 standing.

46:61 Clinical Pharmacy: Drug Information 2 s.h.
Required; application of drug information resources and drug literature evaluation. Prerequisites: 46:110, P4 standing.

46:62 Clinical Pharmacy: Family Practice Therapeutics 2 s.h.
Elective; primary care therapeutics, including lectures and clinical practice experience in Family Practice offices. Prerequisites: 46:110, P4 standing.

46:63 Clinical Pharmacy: Pediatric Allergy 2 s.h.
Elective; includes clinical experience in the drug therapy of asthma, rhinitis, eczema and other allergic disorders. Prerequisites: 46:110, P4 standing.

46:64 Hospital Pharmcay: Radiopharmacy 2 s.h.
Elective; includes pharmacological basis for design, chemistry, preparation, quality control, and clinical application of radiopharmaceuticals. Prerequisites: 46:110, P4 standing.

46:65 Clinical Pharmacy: Surgical Therapeutics 3 s.h.
Elective; includes lectures and clinical practice experience in pharmacotherapeutics on a general surgery unit. Prerequisites: 46:110, P4 standing.

46:69 Clinical Pharmacy: Elective Clerkship arr.
Selected rotations in health care facilities. Elective course, may be repeated for credit. Prerequisites: 46:110 and consent of instructor.

46:110 Clinical Pharmacy: Case Study 3 s.h.
Introduction to selected diseases and their treatment: clinical manifestations, principles of drug therapy, laboratory tests, medical terminology, abbreviations, and use of reference sources. Prerequisites: 72:150, 46:131, 71:101.

46:111 Clinical Pharmacy: Therapeutics I 2 s.h.
Pharmacotherapeutics of disorders encountered primarily in internal medicine; clinical significance of treatment regimens, analyzed by critiquing clinical case histories. Prerequisite: 46:110.

46:112 Clinical Pharmacy: Therapeutics II 2 s.h.
Pharmacodynamics of disorders most commonly encountered in outpatients; clinical significance of treatment regimens. Prerequisite: 46:110.

46:116 Clinical Pharmacy: Antimicrobials 2 s.h.
In-depth discussion of selected topics dealing with clinical use of antimicrobial agents. Offered Spring semester. Prerequisites: 46:131, 71:101.

46:120 Clinical Pharmacy: Psychotherapeutics 4 s.h.
Lecture and laboratory course concerned with rational use of psychiatric drugs in treatment of psychiatric disorders. Prerequisite: P4 or graduate standing.

Graduate Clinical-Hospital Pharmacy

46:107 Hospital-Pharmacy: Survey 3 s.h.
Hospital as part of American health care system; financing, planning; accreditation, organization and management, with particular attention to pharmacy; organizing, staffing and operating hospital pharmacy; particular emphasis on supervision of professionals; relevant statute and common law. Prerequisite: consent of instructor.

46:108 Hospital Pharmacy: Survey 3 s.h.
Continuation of 46:107; medical staff-pharmacy relations; pharmacy committee, formulary; special aspects of hospital drug procurement; theory and practice of inventory control; drug distribution and pharmacy service, and pharmacy service systems; drug utilization review; drug information services; planning and design; budgeting and reporting. Prerequisite: consent of instructor.

46:114 Advanced Clinical Pharmacy 4 s.h.
Application of principles of pharmacology and pharmaceutics to the treatment of hospitalized patients; students participate in ward rounds and conferences with the medical staff, and monitor patients on various types of drug therapy; emphasis on drug selection, adverse effects of drugs and disease modification of therapeutic and toxic responses. Prerequisites: 46:110 and consent of instructor.

46:115 Clinical Pharmacy: Drug Literature Review and Evaluation 2 s.h.
Acquaints the pharmacist with the literature of hospital pharmacy practice, including clinical aspects; emphasis on techniques of evaluating biomedical literature; randomization, stratification, controls blinding, etc., discussed. An understanding of statistics is necessary. Prerequisite: consent of instructor.

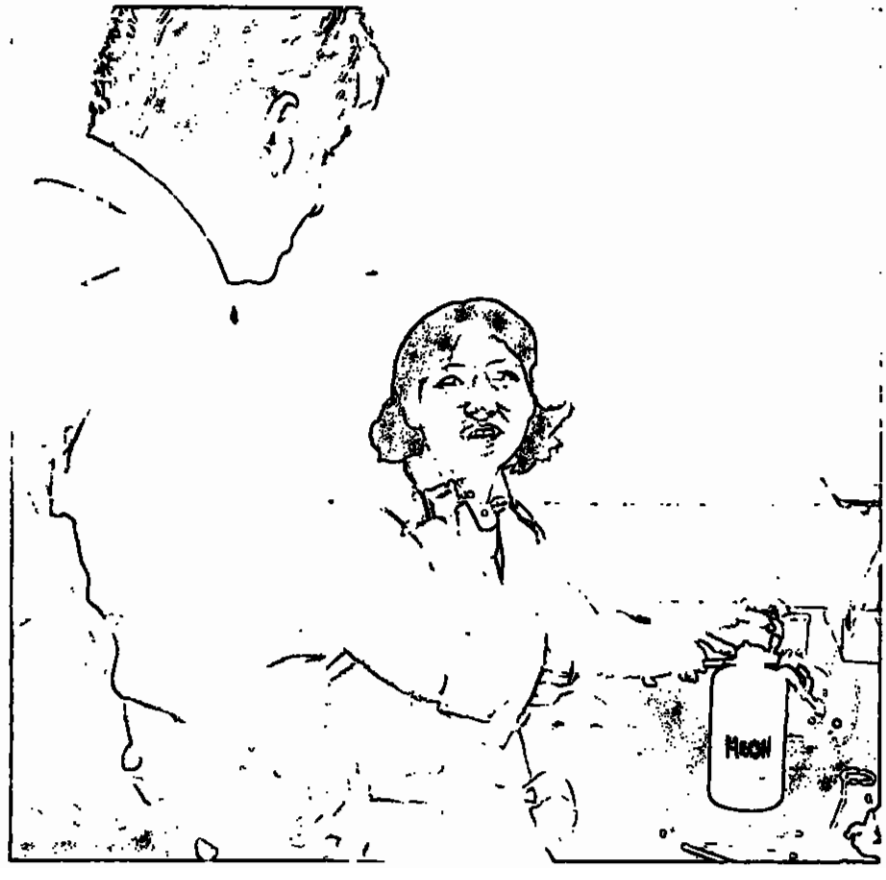
46:204 Hospital Pharmacy: Parenterals 3 s.h.
Theory and applications in preparation, packaging and testing of parenteral dosage forms.

46:242 Clinical Pharmacotherapeutics 3 s.h.
Analysis of contemporary pharmacotherapeutics in selected disease states; discussions from current literature emphasizing individualization of dosage regimens, relative efficacy and risks of drug therapy. Prerequisite: 46:112 or consent of instructor.

46:243 Hospital Pharmacy: Research arr.

46:245 Hospital Pharmacy: Seminar 0-1 s.h.
Topics of current interest in the specialty of hospital pharmacy. May be repeated for credit.

46:247 Hospital Pharmacy: Directed Study in Administrative Problems 1-3 s.h.
Application of basic organizational and administrative theory to practical problems in hospital pharmacy administration; materials and personnel management, budgeting and forecasting, systems and physical plant design. Prerequisites: 46:108, 63:161 or equivalent.



Continuing Education

The Division of Continuing Education was established by special appropriation of the General Assembly of Iowa to "render a larger service to the Commonwealth and to the people of Iowa by carrying out to every part of the State the knowledge, the thought, the ideals and the spirit of the several departments and colleges of the University and by bringing the University generally into direct contact with the citizen." The Division's organization and services include:

Center for Credit Programs

Correspondence Courses

Correspondence courses are available for credit toward a degree, for preparation for special occupations or for self-improvement. Resident students at The University of Iowa must obtain the permission of the dean of their college to enroll in correspondence courses for degree credit.

Correspondence study is offered in accounting, American studies, anthropology, business administration, chemistry, classics, economics, education, English, French, geography, Greek, history, home economics, journalism, Latin, letters, mathematics, music, physical education, police science, political science, psychology, religion, social work, sociology, Spanish and speech and dramatic art.

There is a $5 enrollment fee. The course fee is $22 per semester hour. Fees are payable at the time of registration. A catalog including procedure and enrollment forms may be obtained from Correspondence Study, W400 East Hall.

The University, in cooperation with the federal Department of Defense, offers many correspondence courses to men and women in the armed services. Personnel should visit their education officer. Veterans may enroll for correspondence courses concurrently with other academic study under Public Law 92-540. Veterans are referred to Veterans Affairs Office of the University.

Off-Campus Classes

The Division offers off-campus classes in liberal arts, business administration, education and engineering. Classes are scheduled at the request of public school officials, or where professional groups and industry indicate a specific need for educational services. Courses offered in business administration and engineering are scheduled on a contractual basis; courses in liberal arts and education require a minimum of 20 enrollees. For information, write to the Center for Credit Programs, W400 East Hall, The University of Iowa.

Saturday and Evening Class Program

This program provides credit course offerings for part-time undergraduate, graduate or unclassified students. Courses are offered from all schools and departments of the University. Through this program a selection of women's studies courses are offered. For a Saturday and Evening Class catalog, write to Saturday and Evening Class Program, W400 East Hall, The University of Iowa.

Bachelor of Liberal Studies Degree

The Bachelor of Liberal Studies degree is designed to serve adults who cannot attend college as full-time, on-campus students. Credit toward the degree, which is awarded by the College of Liberal Arts, may be earned through correspondence study, Saturday and Evening classes, off-campus courses, and newspaper, radio, and television courses. For information, write to the Center for Credit Programs, W400 East Hall, The University of Iowa.

Education Tests

Standardized tests and scales developed at The University of Iowa are published and distributed on a nonprofit basis to schools, public agencies and industrial firms in Iowa

and throughout the nation. In addition, many other widely-used, commercially-produced standardized tests and scales with established national reputations are carried in stock for distribution. Buyers order test needs from this one source to save time and transportation costs. Orders received for items regularly carried in stock are usually shipped within 24 hours. For catalogs, write to Education Tests, C20 East Hall, The University of Iowa.

Center for Conferences and Institutes

The Center serves as the principal agency of the University for developing, coordinating and conducting noncredit continuing education programs for nonresident adults and for administering the University's Continuing Education Unit (CEU) program. The Center's primary goal is to enhance the usefulness of the University as a center of learning and to provide educational opportunities for people who are no longer full-time students but who seek new knowledge related to their jobs, professions or special interests.

Each year more than 30,000 adults receive training in the Center's varied programs, which represent a cooperative endeavor between the Center and the various colleges, departments and disciplines within the University. The marshaling of appropriate resources, coupled with the professional planning and execution of conferences and other short-term training programs, helps to ensure the achievement of the educational objectives specified for each training meeting.

The Director of Conferences is responsible for approving and conducting or coordinating all conferences, institutes, short courses and similar noncredit programs held in the Iowa Memorial Union for other than on-campus student groups. All members of the faculty and staff who plan University conferences and other University-related group functions to be held on campus (or in the Iowa City-Coralville community) are expected to schedule these activities through the Conference Center office and to utilize the conference facilities, dining services and lodging accommodations at the Iowa Memorial Union, to the extent they are available and appropriate.

Adult Education Mini-Course Program

This open enrollment program provides a wide variety of noncredit, short-course offerings of special interest to adults. Courses are normally conducted at the Iowa Memorial Union during evening hours by University-affiliated instructors. Continuing Education Units are awarded for course completion. For current catalog offerings contact the Center for Conferences and Institutes.

Radio Broadcasting Services

WSUI and KSUI-FM serve the needs and interests of the people of eastern Iowa with an 18 hours/day, 365 days/year broadcasting service which extends the resources and activities of the University. The broadcast schedule consists of educational, cultural and informative programming not available elsewhere. As an affiliate of National Public Radio (NPR), WSUI contributes program materials to a national network of more than 180 non-commercial radio stations. The main studios and offices are located in 3300 Engineering Building and a free copy of the *Program Guide* may be obtained by writing to that address.

Institute of Public Affairs

The mission of the Institute is to help improve state, city and county governments in Iowa by serving as the primary research and continuing education link between the University and those governments. Services of the Institute are available to state and local government agencies and to citizen groups interested in civic affairs.

The Institute has a full-time research and training staff. Through the Institute, other resources of the University are applied to problems faced by Iowa public officials. The Institute also works in close cooperation with organizations of public officials such as the League of Iowa Municipalities and the Iowa State Association of Counties.

The Institute provides:

In-service training and continuing education services to public personnel, primarily managers and supervisors, offering a wide variety of courses and programs aimed at meeting individual and organization needs as well as professional goals;

Research services, informational resources and publications ranging from practical handbooks to issue papers; and

Consultation services, ranging from answering "how-to" questions to serving on statewide government committees dealing with major concerns of state and local governments.

Bureau of Police Science

The Bureau offers a series of law enforcement courses through correspondence study. In addition, the Bureau offers a variety of services to law enforcement agencies, including entrance and promotional examinations, general administrative or specialized surveys, and specialized training programs. It also carries out research programs in areas of public safety. Upon request by law enforcement agencies, the Bureau conducts personnel examinations, administrative surveys and record surveys.

Iowa Center for Education in Politics

Supported by gifts from foundations and others and headquartered in the Division of Continuing Education, the Iowa Center for Education in Politics coordinates activities at all colleges and universities in Iowa, to encourage students to become active in political affairs. The Center also sponsors programs to help teachers improve their teaching about politics at the high school level. These programs are planned in cooperation with leaders of the legally-recognized political parties of the state and college teachers and administrators.

Iowa Community Service and Continuing Education Program

The Division of Continuing Education serves as administrative and fiscal agent for the Iowa Community Service and Continuing Education Program, a cooperative state-federal program to expand the continuing education services of colleges and universities toward solving community problems and meeting continuing education needs of adults. A state advisory council assists in identifying community problems and continuing education needs, recommends appropriate institutional activities and approves

proposed projects submitted by colleges and universities in Iowa. The program was authorized by the U.S. Congress in Title I-A of the Higher Education Act of 1965.

Office of Community College Affairs

The Office of Community College Affairs (OCCA), which is closely aligned with the College of Education, is the liaison office between the University and Iowa's area community and vocational-technical colleges. In activities involving discipline articulation and student follow-up, OCCA extends its services to the private two- and four-year colleges in the state. The Office serves these educational systems and their respective personnel by providing these services:

- Provides liaison between the University and statewide professional educator associations as well as selected regional and national organizations, and conducts relevant research;
- Articulates university-community college faculty, student, institutional policy, and curriculua;
- Provides in-service training opportunities for community college personnel, and assistance to the College of Education and other University colleges and departments in providing degree programs for community college personnel leading to state certification;
- Participates in state, regional, and national approval, accreditation and consultation activities; and
- Provides regular information, consultation, and coordination services for specialized groupings of community college personnel.

Iowa Lakeside Laboratory

The Division has general administrative supervision of the Iowa Lakeside Laboratory, a summer laboratory for the biological sciences on Lake Okoboji. A cooperative program in teaching and research is carried on under the auspices of Iowa State University, University of Northern Iowa and The University of Iowa. Two terms of five weeks each are held during June, July and August. Facilities for year-round research are available. For information, write to the Division of Continuing Education.

Macbride Field Campus

The University holds a lease from the U.S. Army Corps of Engineers on two tracts of land in the Coralville Reservoir area north of Iowa City. The two tracts total approximately 620 acres. One tract is reserved for biological research, the other for University-wide activities. Developments in the area to date include provision of an access road, water supply, electric power, maintenance storage facilities, a boathouse and sailing facilities, field archery course, facilities for handicapped persons and picnic areas.

Audiovisual Center

The mission of the Audiovisual Center is to assist in the improvement of the teaching-learning process through the effective use of educational media. Services and facilities include:

Media Development

The Audiovisual Center staff is available to assist faculty and staff in the solution of instructional problems related to the design of learning systems and facilities, and the selection and production of educational media.

Media Library

The Media Library provides a major collection of 16mm instructional films, available on campus without charge, for instruction and curriculum-related activities, and for rental to off-campus requestors. Smaller collections of audio and video recordings, filmstrips, and slides, plus facilities for student or faculty utilization, are also available. Catalogs of these collections are available upon request. A reference collection of materials from other sources is also maintained.

Campus Service

Audiovisual equipment available without charge for instructional use includes film, slide, filmstrip, opaque and overhead projectors; portable projection screens; audio-tape recorders; record players; portable public-address systems; and display devices (exhibits, easels, boards). There is a nominal charge for projectionist service and for equipment requested for conferences and/or off-campus use. Repair service is available at a nominal charge for all AV equipment including TV systems.

Media Production

Professional services, facilities, and equipment are available to produce original software in all media:

- Graphics—design, layout, paste-up, illustrations, charts, graphs, lettering, etc.
- Audio—recording, editing, duplication, transcription service
- Motion picture—scripts, cinematography, editing, complete processing and printing laboratory
- Photography—portraits, passports, slide shows, filmstrips, 35mm slide duplication, complete printing and processing services
- Television—video production, color and black & white (1 inch and cassette); systems design; equipment maintenance; portapak rental
- Fabrication—design and construction of displays, specialized audiovisual equipment and furniture

Satellite Centers

Satellite centers are established as needs arise through cooperative arrangements between the Audiovisual Center and departments, schools, colleges and other service agencies. Currently they include the Medical Audiovisual Center, Dental Audiovisual Center, Nursing Audiovisual Center, the Educational Media Laboratory and the Music Audiovisual Center.

Administrative Officers

State Board of Regents

The University of Iowa, Iowa State University of Science and Technology, the University of Northern Iowa, the Iowa Braille and Sight-Saving School, and the Iowa School for the Deaf are governed by the State Board of Regents, consisting of nine members. The Board membership is as follows:

President: Mary Louise Petersen, Harlan
Ray V. Bailey, Milford
Stanley Barber, Wellman
Constance Belin, Des Moines
S.J. Brownlee, Emmetsburg
Percy G. Harris, Cedar Rapids
Donald Shaw, Davenport
Harry Slife, Waterloo
Peter J. Wenstrand, Essex
Executive secretary: R. Wayne Richey

Central Administration

President: Willard L. Boyd
Vice-president for Academic Affairs and Dean of the Faculties: May Brodbeck
Vice-president for Administrative Services: William Shanhouse
Vice-president for Educational Development and Research, Dean of the Graduate College: Duane C. Spriestersbach
Vice-president for Finance and University Services: Edward H. Jennings
Vice-president for Student Services and Dean of Academic Affairs: Philip G. Hubbard

Academic Affairs

Vice-president and Dean of the Faculties: May Brodbeck

College of Business Administration

Dean: J. Richard Zecher
Center for Labor and Management Director: Duane Thompson
Industrial Relations Institute Director: Anthony J. Sinicropi
Institute for Economic Research Director: Jerald Barnard
Institute for Insurance Education and Research Director: Emmett J. Vaughan

College of Dentistry

Dean: James H. McLeran
Dows Institute for Dental Research Director: Ian Mackenzie

College of Education

Dean: Howard R. Jones

College of Engineering

Dean: Robert G. Hering
Institute of Hydraulic Research Director: John F. Kennedy

Graduate College

Dean: Duane C. Spriestersbach
Dean of Advanced Studies: Rudolph W. Schulz

College of Law

Dean: N. William Hines

College of Liberal Arts

Dean: Howard Laster
School of Art and Art History Director: Waltomasini
School of Journalism Director: Kenneth Starck
School of Letters Acting Director: Richard Lloyd-Jones
School of Library Science Director: Frederick Wezeman
School of Music Director: Himie Voxman
School of Religion Director: James C. Spalding
School of Social Work Director: Ruth A. Brandwein

College of Medicine

Dean: John W. Eckstein

College of Nursing

Dean: Evelyn Barritt

College of Pharmacy

Dean: Dale E. Wurster

Division of Continuing Education

Dean: Robert F. Ray
Audiovisual Center Director: William Oglesby
Bureau of Police Science Director: Richard Holcomb
Center for Conferences and Institutes Director: Jack W. Huttig
Center for Credit Programs Acting Director: M. Dean Zenor
Community College Affairs Director: Duane D. Anderson
Institute of Public Affairs Director: Clayton Ringgenberg
Iowa Lakeside Laboratory Director: Richard V. Bovbjerg
Macbride Field Campus Director: N.R. Holzaepfel
Radio Stations WSUI-KSUI Director: Hugh V. Cordier

Libraries

Dean of Library Administration: Leslie W. Dunlap

Summer Session

Acting Director: Sue R. Rosner

Educational Development and Research

Vice-president: Duane C. Spriestersbach
Associate Vice-president: William J. Farrell

Division of Sponsored Programs

Director: Margery E. Hoppin

Office of Project Development

Director: John D. McBride

Institute of Child Behavior and Development

Director: Gerald S. Solomons

Health Services Research Center

Director: Gerard Rushton

Office of International Education and Services

Director: Stephen M. Arum

Weeg Computing Center

Acting Director: James W. Johnson

Public Information and University Relations

Director: Thomas L. Tobin

Radiation Protection

Director: William E. Twaler

State Archaeologist

Duane C. Anderson

University House

Acting Director: William J. Farrell

University Press

Director: John Simmons

Institute of Urban and Regional Research

Director: Kenneth J. Dueker

Student Services

Vice-president: Philip G. Hubbard

Admissions

Director: John E. Moore

Registrar

University Registrar and Dean of Convocations: W. Albert Cox

Iowa Center for the Arts

Coordinator and Director of Auditoria: James H. Wockenfuss

Iowa Memorial Union

Manager: James M. Burke

Student Activities

Director: Peter G. Wirtz

Campus Information Center

Director: Jean Kendall

Career Services and Placement

Director: Corinne Hamilton

University Counseling Service

Director: Ursula Delworth

Special Support Services

Director: M. Colleen Jones

Student Financial Aids

Director: John E. Moore

University Examination and Evaluation Services

Director: Douglas R. Whitney

Recreational Services

Director: Harry R. Ostrander

Finance and University Services

Vice-president: Edward H. Jennings

Business Office

Business Manager and Treasurer: Ray B. Mossman
Controller and Secretary: Leonard R. Brcka
Director of Purchasing: Wayne F. Chadima

Physical Plant

Director: Duane A. Nolisch

Administrative Services

Vice-president: William M. Shanhouse

University Personnel Service

Director: Fred H. Doderer

Residence Services

Director: Mitchel D. Livingston

Facilities Planning and Utilization

Director: Richard E. Gibson

Museum of Art

Director: Jan K. Muhlert

Old Capitol

Director: Margaret Keyes

University Architect

Richard R. Jordison

Environmental Health Services

Director: Franklin J. Kilpatrick
Services for Handicapped Coordinator: Rebecca Pittman

University Health Services

Assistant to the President for Health Services: John W. Colloton

University Hospitals and Clinics

Director: John W. Colloton

Psychiatric Hospital

Director: George Winokur

State Hygienic Laboratory

Director: William J. Hausler

University Hospital School

Director: Alfred Healy

Student Health

Director: Harley G. Feldick

State Services for Crippled Children

Director: John C. MacQueen

General University

Alumni Association

Executive Director: Joseph W. Meyer

Intercollegiate Athletics for Men

Director: Chalmers W. Elliott

Intercollegiate Athletics for Women

Director: Christine Grant

University of Iowa Foundation

Executive Director: Darrell D. Wyrick

Academic Personnel

Abbas, Paul J., B.S. Massachusetts Institute of Technology 1969, Ph.D. Johns Hopkins 1974; *assistant professor, Speech Pathology and Audiology, 1974*

Abboud, Francois, Baccalaureate Christian Brothers' Schools (Egypt) 1948, PNS Cairo (Egypt) 1949, M.B.B.Ch. Ain Shams (Egypt) 1955; *professor, Internal Medicine and Physiology and Biophysics, 1961 (1968)*

Abel, Charles M., B.A. Morningside 1962, M.S.W. Nebraska 1964; *assistant professor, School of Social Work, 1969 (1973)*

Abrams, Michael E., B.A. Luther 1963, M.D. Iowa 1967; *clinical assistant professor, Family Practice, 1972 (1977)*

Acevedo, Alejandro, B.S. Loyola (Louisiana) 1952, D.D.S. 1956; *associate professor, Oral Surgery, 1976*

Achepohl, Keith A., B.A. Knox 1956, M.F.A. Iowa 1960; *associate professor, School of Art and Art History, 1973*

Adams, Clifton D., B.A. Iowa 1951, D.D.S. 1955, M.S. 1956, M.S.D. Washington 1967; *adjunct professor, Orthodontics, 1974*

Adams, Harold J., B.A. Albion 1961, M.A. Michigan 1964, Ph.D. 1968; *associate professor, Counselor Education, 1968 (1973)*

Adams, Harold P., B.A. Drake 1966, B.S. South Dakota (Vermillion) 1968, M.D. Northwestern 1970; *assistant professor, Neurology, 1976*

Addis, Laird C., Jr., B.A. Iowa 1959, M.A. Brown 1960, Ph.D. Iowa 1964; *professor, Philosophy, 1963 (1974)*

Ahrens, Gary A., B.A. Chicago 1970, J.D. Virginia 1973; *assistant professor, Business Administration, 1975*

Alkin, Judith P., B.A. Oregon 1968, M.A. 1969, Ph.D. California (Berkeley) 1974; *assistant professor, German, 1975*

Akers, Ronald L., B.S. Indiana State 1960, M.A. Kent State 1961, Ph.D. Kentucky 1966; *professor, Sociology, 1974*

Albrecht, William P., B.A. Princeton 1956, M.A. South Carolina 1962, M.A. Yale 1963, Ph.D. 1965; *associate professor, Economics, 1965 (1970)*

Albright, John P., A.B. Illinois 1963, M.D. Loyola University (Chicago) 1967; *associate professor, Orthopaedic Surgery, 1972 (1976)*

Alcorn, Marie O., B.S. Iowa State 1946, M.D. Creighton 1950; *clinical assistant professor, Family Practice, 1975*

Alden, L. Elizabeth, B.A. Lawrence 1941, M.A. Mills 1943, Ph.D. W E State 1960; *associate professor, Home Economics, 1963*

Alexander, Bruce, B.S. Drake 1974, Pharm.D. Minnesota 1976; *clinical assistant professor, Pharmacy, 1976*

Alexander, M. Paul, B.A. Wooster 1952, M.Div. McCormick Theological Seminary 1960, Th.M. Princeton 1968; *instructor, School of Social Work, 1977*

Alexander, Margaret A., B.A. Wheaton 1938, M.A. New York 1941, Ph.D. 1958; *professor, Classics, 1962 (1976)*

Alexander, Michael M., B.S. Illinois 1974, Pharm.D. Cincinnati 1976; *clinical assistant professor, Pharmacy, 1977*

Alexander, Michael R., B.S. University of the Pacific 1965, M.S. 1971; *clinical assistant professor, Pharmacy, 1974*

Alexander, Robert L., B.A. Queens 1942, A.M. New York 1942, Ph.D. 1961; *professor, School of Art and Art History, 1961 (1969)*

Alexander, Susan L., B.A. Arkansas Polytechnic 1972, M.A. Southern Methodist 1974, Ph.D. 1977; *assistant professor, Economics, 1977*

Al-Jurf, Adel S., M.B., B.Ch. Cairo (Egypt) 1966; *assistant professor, Surgery, 1977 (1978)*

Allen, Judith N., B.F.A. Oklahoma 1969, M.F.A. North Carolina 1970; *assistant professor, Physical Education and Dance, 1972 (1976)*

Alley, Louis E., B.S.Ed. Central Missouri State Teachers 1935, M.S. Wisconsin 1941, Ph.D. Iowa 1949; *professor, Physical Education, 1942 (1959)*

Altman, Charles F., A.B. Duke 1966, M.A. 1966, Ph.D. Yale 1971; *associate professor, French and Italian, 1974 (1977)*

Altman, Janet G., B.A. Duke 1967, M.Ph. Yale 1970, Ph.D. 1973; *associate professor, French and Italian, 1974 (1978)*

Alton, Donald A., B.A. Rice 1965, Ph.D. Cornell 1970; *associate professor, Computer Science, 1970 (1974)*

Alton, Everett D., B.A. Iowa State Teachers 1939, M.S.E.E. Iowa 1955; *associate professor, Information Engineering, 1955 (1967)*

Amada, Kenneth, B.A. Rutgers 1951; *professor, School of Music, 1967 (1976)*

Ambler, Bruce, B.S. Haverford 1937, M.D. Pennsylvania 1941; *clinical instructor, Psychiatry, 1971*

Ambre, John J., B.S. Notre Dame 1959, M.D. Loyola 1963, M.S. Iowa 1970, Ph.D. 1972; *associate professor, Internal Medicine and Pharmacology, 1972 (1975)*

Amert, Kay L., B.G.S. Iowa 1972; *assistant professor, School of Journalism, 1972 (1977)*

Amundsen, Louis R., B.S. Wisconsin 1964, Ph.D. 1972; *assistant professor, Physical Therapy, 1974*

Anderson, Alan E., B.S. Cincinnati 1963, M.D. 1966; *assistant professor, Surgery, 1977*

Anderson, Charles V., B.S. Nebraska 1955, M.A. 1957, Ph.D. Pittsburgh 1962; *associate professor, Otolaryngology and Maxillofacial Surgery and Speech Pathology and Audiology, 1966 (1968)*

Anderson, Daniel D., B.A. Iowa 1971, M.S. Chicago 1971, Ph.D. 1974; *assistant professor, Mathematics, 1974*

Anderson, Duane C., B.A. Colorado 1965, M.A. 1967, Ph.D. 1972; *adjunct associate professor, Anthropology, 1975*

Anderson, Duane D., B.S. Wisconsin 1952, M.A. Northwestern 1955, Ph.D. Michigan 1969; *associate professor, Postsecondary and Continuing Education, 1965 (1970)*

Anderson, Kenneth W., B.S. Illinois 1968, M.D. Northwestern 1972; *clinical assistant professor, Pediatrics, 1975*

Anderson, Leland D., D.D.S. Iowa 1924; *professor emeritus, Operative Dentistry, 1943 (1968)*

Anderson, Paul G., B.M. Iowa 1948, M.A. 1949; *professor, School of Music, 1949 (1968)*

Anderson, Ralph E., B.A. Minnesota 1950, M.S.W. Nebraska 1953; *professor, School of Social Work, 1963 (1975)*

Anderson, Richard L., B.A. Grinnell 1967, M.D. Iowa 1971; *assistant professor, Ophthalmology, 1975 (1976)*

Anderson, Robert W., B.A. Iowa 1955, M.D. 1955; *clinical assistant professor, Pediatrics, 1976*

Anderson, Thomas A., B.A. Washington 1950, B.S. California State Polytechnic 1956, M.S. Arizona 1961, Ph.D. 1962; *professor, Pediatrics, 1970 (1974)*

Andreasen, George F., B.S. Nebraska 1955, D.D.C. 1959, D.D.S. 1963; *professor, Orthodontics, 1963 (1972)*

Andreasen, Nancy C., B.A. Nebraska 1958, M.A. Radcliffe 1959, Ph.D. Nebraska 1963, M.D. Iowa 1970; *associate professor, Psychiatry, 1973 (1977).*

Andrew, J. Dudley, B.A. Notre Dame 1967, M.F.A. Columbia 1969, Ph.D. Iowa 1972; *associate professor, Speech and Dramatic Art and English, 1969 (1975)*

Andrews, James G., B.S.M.E. Iowa 1957, M.S. 1959; *associate professor, Materials Engineering, 1964 (1970)*

Anstey, B. Eleanor, B.A. Marycrest 1953, M.A. Creighton 1959, M.A. Manhattanville 1968; *assistant professor, School of Social Work, 1974 (1978)*

Antes, Joella J., B.S. Iowa State 1941, M.A. Chicago 1952; *assistant professor emeritus, Nursing, 1941 (1972)*

Anuras, Sinn, B.S. Mahidol (Thailand) 1962, M.D. Chulalongkorn (Thailand) 1966; *assistant professor, Internal Medicine, 1973 (1975)*

Appleby, Ralph C., B.S. Iowa 1941, D.D.S. 1951, M.S. 1953; *professor, Removable Prosthodontics, 1951 (1959)*

Arab, Siddi Moahmed, B.S. University of the Panjab (Pakistan) 1965, M.B. King Edward Medical (Pakistan) 1965, D.C.H. Royal College of Physicians and Surgeons (England) 1969; *clinical assistant professor, Pediatrics, 1977*

Arkush, R. David, B.A. Yale 1962, A.M. Harvard 1964, Ph.D. 1976; *assistant professor, History, 1972 (1975)*

Armbruster, David, B.A. Iowa 1920, M.A. 1931; *associate professor emeritus, Physical Education, 1916 (1958)*

Armens, Sven M., B.A. Tufts 1943, M.A. Harvard 1947, Ph.D. 1951; *professor, English, 1950 (1966)*

Armstrong, Mark L., B.A. Houghton 1942, M.D. Columbia 1951; *professor, Internal Medicine, 1956 (1971)*

Arneson, Sara W., B.S. College of St. Teresa 1963, M.S. Wisconsin 1967; *assistant professor, Nursing, 1973*

Arnone, Arthur, B.S. New York 1964, M.S. 1966, Ph.D. Massuchusetts Institute of Technology 1970; *associate professor, Biochemistry, 1973 (1978)*

Arora, Jasbir S., B.S. Punjab (India) 1964, M.S. Kansas State 1967, Ph.D. Iowa 1971; *associate professor, Materials Engineering and Physical Therapy, 1972 (1976)*

Arterian, Hannah R., B.A. Elmira 1970, J.D. Iowa 1973; *associate professor, Law, 1977*

Arzbaecher, Robert C., B.S. Fournier Institute 1953, M.S. Illinois 1959, Ph.D. 1960; *professor, Information Engineering, 1976*

Aschenbrener, Carol A., B.S. Clarke 1966, M.S. Iowa 1968, M.D. North Carolina 1971; *assistant professor, Pathology, 1974*

Ascroft, Joseph R., B.Soc.Sc. Capetown (South Africa) 1956, M.A. Michigan State 1966, Ph.D. 1969; *associate professor, School of Journalism, 1970 (1974)*

Asprey, Gene M., B.S. Morningside 1947, M.S. Colorado 1953, Ph.D. Iowa 1958; *professor, Physical Education, 1959 (1970)*

Atcherson, Walter T., B.A. Gustavus Adolphus 1953, Ph.D. Indiana 1960; *professor, School of Music, 1964 (1972)*

Atkinson, Kendall E., B.S. Iowa State 1961, M.S. Wisconsin 1963, Ph.D. 1966; *professor, Mathematics, 1972 (1975)*

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Avcin, Matthew J., Jr., B.A. Lafayette 1965, M.S. Illinois 1969, Ph.D. 1974; *adjunct professor, Geology, 1976*

Avery, James A., B.M. Kansas 1959, M.M. Indiana 1961; *professor, School of Music, 1967 (1976)*

Aydelotte, William O., B.A. Harvard 1931, Ph.D. Cambridge (England) 1934; *Carver professor emeritus, History, 1947 (1978)*

Ayres, Thomas A., B.A. Iowa 1938, M.A. 1941; *professor, School of Music, 1952 (1975)*

Babin, Richard W., B.S. University of the Pacific 1965, M.D. California (Los Angeles) 1969; *assistant professor, Otolaryngology and Maxillofacial Surgery, 1976*

Bader, Iva Marie, B.S. Iowa State Teachers 1935, M.A. Iowa 1963; *assistant professor, Home Economics and Secondary Education, 1964 (1973)*

Baender, Paul, B.A. California (Berkeley) 1949, M.A. 1952, Ph.D. 1956; *professor, English, 1960 (1968)*

Baenziger, Norman C., B.S. Hamline 1943, Ph.D. Iowa State 1948; *professor, Chemistry, 1949 (1957)*

Bagford, Jack, M.Ed. Miami (Ohio) 1956, Ed.D. Indiana 1960; *professor, Early Childhood and Elementary Education, 1962 (1970)*

Bailey, E. Norman, B.S. Indiana 1960, M.B.A. 1961, D.B.A. 1964; *associate professor, Business Administration, 1967*

Baird, A. Craig, B.A. Wabash 1907, B.D. Union Theological Seminary 1910, M.A. Columbia 1912, Litt.D. Wabash 1932; *professor emeritus, Speech and Dramatic Art, 1925 (1952)*

Baird, Robert D., B.A. Houghton 1954, B.D. Fuller Theological Seminary 1957, S.T.M. Southern Methodist 1958, Ph.D. Iowa 1964; *professor, School of Religion, 1966 (1974)*

Baker, George L., A.B. Missouri 1956, M.D. 1960; *professor, Pediatrics, 1964 (1974)*

Baker, Joseph E., B.A. Illinois 1927, M.A. 1928, Ph.D. Princeton 1931; *professor emeritus, English, 1935 (1973)*

Baker, Richard G., B.A. Wisconsin 1960, M.A. Minnesota 1964, Ph.D. Colorado 1969; *associate professor, Geology, 1970 (1975)*

Baker, Theodore P., A.B. Cornell 1970, Ph.D. 1974; *associate professor, Computer Science, 1977*

Balch, Michael S., B.S. Pratt 1960, M.S. New York 1962, Ph.D. 1965; *associate professor, Economics, 1971*

Baldus, David C., A.B. Dartmouth 1957, M.A. Pittsburgh 1962, L.L.B. Yale 1964, L.L.M. 1969; *professor, Law, 1969 (1972)*

Banes, Jerry D., D.D.S. Iowa 1963; *adjunct assistant professor, Family Dentistry, 1974*

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Bar, Robert S., B.S. Tufts 1964, M.S. Ohio State 1970, M.D. 1970; *assistant professor, Internal Medicine, 1977*

Bardach, Janusz, M.B. Moscow Medical Institute (U.S.S.R.) 1950, M.D. 1953; *professor, Otolaryngology and Maxillofacial Surgery and Surgery, 1972*

Barfknecht, Charles F., B.S. Wisconsin 1960, Ph.D. Kansas 1964; *professor, Pharmacy, 1967 (1974)*

Barkan, Joel D., A.B. Cornell 1963, M.A. California (Los Angeles) 1965, Ph.D. 1970; *associate professor, Political Science, 1972 (1976)*

Barker, John C., B.S.E.E. Northwestern 1957, M.B.A. 1961, M.D. Iowa 1969; *clinical assistant professor, Family Practice, 1975*

Barnard, Jerald, B.S. Utah State 1959, M.S. 1962, Ph.D. Iowa State 1965; *professor, Economics, 1965 (1977)*

Barnes, Billy L., B.S. Austin 1947, M.B.A. Texas Christian 1949, Ph.D. Illinois 1958, C.P.A.; *professor, Accounting, 1955 (1963)*

Barnes, H. Verdain, B.A. McMurry 1958, B.D. Yale 1965, M.D. Vanderbilt 1968; *associate professor, Internal Medicine and Pediatrics, 1975*

Baron, Jeffrey, B.S. Connecticut 1965, Ph.D. Michigan 1969; *associate professor, Pharmacology, 1972 (1975)*

Baron, Penny H., B.A. Penn State 1964, M.A. Minnesota 1968, Ph.D. 1970; *associate professor, Business Administration, 1970 (1975)*

Baron, Robert J., A.B. San Diego State 1963, M.S. Cornell 1965, Ph.D. 1968; *associate professor, Computer Science, 1970 (1974)*

Baron, Robert S., B.S. Cornell 1965, Ph.D. Minnesota 1970; *associate professor, Psychology, 1970 (1975)*

Barritt, Evelyn R., B.S.N. Ohio State 1956, M.A. 1962, Ph.D. 1971; *professor, Nursing, 1972*

Bartels, Robert D., B.A. Michigan 1966, J.D. Stanford 1969; *professor, Law, 1971 (1977)*

Bartlett, William G., B.S. Morningside 1967, D.O. College of Osteopathic Medicine; *clinical assistant professor, Pediatrics, 1977*

Barudin, Barry S., A.B. Lafayette 1968, M.D. Chicago Medical School 1972; *clinical assistant professor, Pediatrics 1978*

Bassiri, Rahim M., M.D. Tehran (Iran) 1965; *clinical assistant professor, Internal Medicine, 1976*

Bastron, Robert D., B.A. Iowa 1960, M.D. 1964; *professor, Anesthesia, 1969 (1976)*

Baumback, Clifford M., B.S. Springfield 1938, M.B.A. Northwestern 1945, Ph.D. Iowa 1953; *professor, Business Administration, 1953 (1968)*

Bayne, David C., S. J., A.B. Detroit 1939, M.A. Loyola University (Chicago) 1947, LL.M. Georgetown 1947, S.J.D. Yale 1949, S.T.L. West Baden 1953; *professor, Law, 1967*

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Beam, Kurt G., B.A. Pomona 1967, Ph.D. Washington 1974; *assistant professor, Physiology and Biophysics, 1977*

Beams, Harold W., B.A. Fairmount 1925, M.A. Northwestern 1926, Ph.D. Wisconsin 1929; *professor emeritus, Zoology, 1930 (1971)*

Beard, Arthur D., B.A. Pennsylvania 1955, M.B.A. Chicago 1969; *assistant professor, Business Administration, 1976*

Beasley, Oscar C., B.S. Kentucky 1948, M.D. Vanderbilt 1952; *clinical associate professor, Internal Medicine, 1974*

Bechtoldt, Harold, B.A. Kansas State Teachers 1936, B.S.Ed. 1936, Ph.D. Chicago 1947; *professor, Psychology, 1948 (1962)*

Beck, James D., A.B. North Carolina 1964, M.S. 1967, Ph.D. 1969; *associate professor, Preventive and Community Dentistry, 1977*

Becker, George E., B.S. Fordham 1956, M.S. Minnesota 1959, Ph.D. 1963; *associate professor, Microbiology, 1965 (1971)*

Becker, Samuel L., B.A. Iowa 1947, M.A. 1949, Ph.D. 1953; *professor, Speech and Dramatic Art, 1950 (1961)*

Beddow, John K., Cert. De La Salle (France) 1950, A.M.C.T.B.Sc. Manchester (England) 1959, Ph.D. Cambridge (England) 1959; *associate professor, Materials Engineering, 1968*

Bedell, George N., A.B. DePauw 1944, M.D. Cincinnati 1946; *professor, Internal Medicine, 1952 (1968)*

Bedford, Clark W., B.M. Michigan 1957, M.M. 1958; *assistant professor, School of Music, 1976*

Beer, John A., B.M. Iowa 1950, M.A. 1951; *associate professor, School of Music, 1960 (1968)*

Begley, Wayne E., B.A. Louisville 1958, M.F.A. Iowa 1962, Ph.D. Pennsylvania 1966; *associate professor, School of Art and Art History, 1966 (1972)*

Belding, Robert E., B.A. Hiram 1939, M.Ed. Boston 1948, Ph.D. Western Reserve 1953; *professor, Education–Non-divisional, 1959 (1965)*

Belgum, David R., B.A. Minnesota 1944, B.D. Northwestern Lutheran Theological Seminary 1946, Ph.D. Boston 1952; *professor, School of Religion and Internal Medicine, 1964 (1969)*

Bell, Marvin H., B.A. Alfred 1958, M.A. Chicago 1961, M.F.A. Iowa 1963; *professor, English, 1965 (1975)*

Bell, William E., A.B. West Virginia 1951, M.S. 1951, B.S. 1953, M.D. Virginia 1955; *professor, Pediatrics and Neurology, 1962 (1972)*

Belman, Lary, B.A. Western Ontario (Canada) 1963, Ph.D. Illinois 1974; *assistant professor, School of Journalism, 1974*

Beltramo, Louise, B.A. Louisiana State 1941, M.A. Iowa 1949, Ph.D. 1954; *professor, Early Childhood and Elementary Education and School of Social Work, 1954 (1966)*

Benavides, Alfredo H., B.A. Texas A & I 1970, M.A. Michigan State 1972, Ph.D. 1976; *assistant professor, Early Childhood and Elementary Education, 1976*

Benda, Evelyn J., B.S.N. Iowa 1973, M.A. 1975; *assistant professor, Nursing, 1975 (1978)*

Bennett, Shelley, B.A. California (Riverside) 1969, M.A. California (Los Angeles) 1975, Ph.D. 1977; *assistant professor, School of Art and Art History, 1978*

Bennett, Teresa F., B.S.N. Iowa 1974, M.A. 1975; *assistant professor, Nursing, 1976 (1978)*

Bennett, William E., B.S. Sterling 1947, Ph.D. Kansas 1951; *associate professor, Chemistry, 1953 (1959)*

Benton, Arthur L., B.A. Oberlin 1931, M.A. 1933, Ph.D. Columbia 1935; *professor emeritus, Psychology and Neurology, 1948 (1978)*

Benton, Rita., B.A. Hunter 1939, M.A. Iowa 1951, Ph.D. 1961; *professor, School of Music, 1973 (1975)*

Bentz, Dale M., B.A. Gettysburg 1939, B.S.L.S. North Carolina 1940, M.S. Illinois 1951; *professor, School of Library Science, 1953 (1964)*

Benz, Gladys, B.S. Columbia 1931, M.A. Michigan State 1940; *professor emeritus, Nursing, 1956 (1964)*

Benz, Lester G., B.A. Morningside 1925, M.A. Iowa 1956; *associate professor emeritus, School of Journalism and Secondary Education, 1953 (1972)*

Berardi, Romeo S., B.S. Boston (Chestnut Hill) 1952, M.S. 1953, M.D. Rome (Italy) 1958; *clinical associate professor, Surgery, 1974*

Berbaum, Kevin S., B.A. Millikin 1971, Ph.D. State University of New York (Buffalo) 1977; *instructor, Psychology, 1977*

Berg, Clarence P., B.A. Augustana 1924, M.A. Illinois 1925, Ph.D. 1929, LL.D. Augustana 1960; *professor emeritus, Biochemistry, 1929 (1968)*

Berg, John W., B.S. Yale 1948, M.D. 1951; *adjunct professor, Preventive Medicine and Environmental Health, 1973*

Bergmann, Gustav, Ph.D. Vienna (Austria) 1928, J D. 1935, Ph.D. Gothenburg (Sweden) 1962; *professor emeritus, Philosophy, 1941 (1974)*

Bergquist, Stephen C., B.S. Drake 1971, M.S. Iowa 1975; *clinical assistant professor, Pharmacy, 1974 (1976)*

Berry, Clyde M., B.S. McKendree 1933, M.S. Illinois 1936, M.S. Iowa 1940, Ph.D. 1941; *professor, Preventive Medicine and Environmental Health, 1955 (1965)*

Bertocci, Angelo P., A.B. Boston 1927, A.M. Harvard 1928, Diplome Grenoble (France) 1930, Ph.D. Columbia 1947; *professor emeritus, English and Comparative Literature, 1966 (1975)*

Betterley, Melvin L., B.S. Stout 1932, M.A. Minnesota 1939; *professor emeritus, Systems Engineering, 1952 (1978)*

Betts, Carl E., B.A. Iowa 1951, M.A. 1957, Ph.D. 1963; *clinical assistant professor, Speech Pathology and Audiology and Pediatrics, 1970*

Bezanson, Randall P., B.S. Northwestern 1968, J.D. Iowa 1971; *associate professor, Law 1973 (1976)*

Bhalla, Ramesh C., B.V.Sc. Panjab (India) 1957, F.R.V.C.S. Stockholm (Sweden) 1962, Ph.D. Wisconsin 1970; *associate professor, Anatomy, 1973 (1976)*

Bhatnagar, Ranbir K., B.S. Lucknow (India) 1954, B.V.S. Agra (India) 1958, M.S. Michigan State 1963, Ph.D. 1971; *associate professor, Pharmacology, 1971 (1977)*

Biller, Ilene R., B.S. Columbia 1970, M.S. 1971; *assistant professor, Dental Hygiene, 1974*

Birch, Eleanor M., A.B. Brown 1949, Ph.D. Iowa 1969; *associate professor, Business Administration, 1968 (1975)*

Birch, John J., Sc.B. Brown 1950, Ph.D. California (Berkeley) 1960; *associate professor, Statistics, 1964*

Bishara, Samir E., B.D.S. Alexandria (Egypt) 1957, D. Orth. Certif. 1967, M.S. Iowa 1970; *professor, Orthodontics, 1970 (1976)*

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Black, Asa C., Jr., B.A. Vanderbilt 1965, Ph.D. 1973; *assistant professor, Anatomy, 1973 (1975)*

Black, Harold J., B.S. Iowa 1953, M.S. 1955; *assistant professor, Pharmacy, 1955 (1965)*

Black, Peter C., B.A. Wheaton 1958, M.D. Western Reserve 1963; *clinical assistant professor, Internal Medicine, 1977*

Blackman, Barbara J., B.S.N. Iowa 1974, M.A. 1976; *instructor, Nursing, 1977*

Blakley, R. L., B.Sc. Canterbury (New Zealand) 1946, M.Sc. 1947, Ph.D. Otago (New Zealand) 1951, D.Sc. Australian National (Australia) 1965; *professor, Biochemistry, 1968*

Blodi, Frederick C., M.D. Vienna (Austria) 1940; *professor, Ophthalmology, 1955 (1965)*

Bloesch, Richard J., B.A. Elmhurst 1952, B.D. Union Theological Seminary 1955, S.M.M. Union Theological Seminary 1959, D.M.A. Illinois 1971; *associate professor, School of Music, 1967 (1974)*

Boals, Alfred J., B.S. Western Michigan 1961, M.S. Michigan 1963, Ph.D. Michigan State 1967; *associate professor, Mathematics, 1967 (1972)*

Boe, Warren J., B.A. Luther 1960, M.S. Iowa State 1964, Ph.D. Purdue 1970; *associate professor, Business Administration, 1970 (1975)*

Boeder, Paul, M.A. Pennsylvania 1926, Ph.D. Gottingen 1931; *professor emeritus, Ophthalmology, 1957 (1970)*

Boersma, Wendell C., B.A. Hope 1948, M.A. Western Michigan 1958, Ph.D. Michigan 1967; *assistant professor, Secondary Education, 1967*

Bogaards, Jerry, M.S.W. Virginia Commonwealth 1966; *adjunct instructor, School of Social Work, 1976*

Boland, Mary L., B.A. Marycrest 1965, M.S.W. Iowa 1976; *assistant professor, School of Social Work, 1976 (1978)*

Bond, Perry A., B.S. Iowa 1901, M.S. 1908, Ph.D. 1915; *professor emeritus, Chemistry, 1908 (1947)*

Bonfield, Arthur E., B.A. Brooklyn 1956, LL.B. Yale 1960, LL.M. 1961; *John F. Murray professor, Law, 1962 (1966)*

Bonfiglio, Michael, A.B. Columbia 1940, M.D. Chicago 1943; *professor, Orthopaedic Surgery, 1950 (1961)*

Bonney, William W., A.B. Whittier 1953, M.D. California (Los Angeles) 1961; *associate professor, Urology, 1969 (1973)*

Boos, Florence, B.A. Michigan 1964, A.M. Harvard 1965, Ph.D. Wisconsin 1972; *associate professor, English, 1973 (1977)*

Borkovec, T. D., B.S. Loyola University of Chicago 1966, M.A. Illinois 1968, Ph.D. 1970; *associate professor, Psychology, 1970 (1974)*

Borts, Irving H., M.D. Iowa 1928; *professor emeritus, Preventive Medicine and Environmental Health, 1929 (1964)*

Bosch, E. Peter, Matura Bundesrealgymnasium Fuersten Feld (Austria) 1963, M.D. Innsbruck (Austria) 1969; *assistant professor, Neurology, 1974 (1976)*

Bostrom, Albert W., M.D. Yale 1947; *assistant professor, Obstetrics and Gynecology, 1976*

Boulware, Lois, B.A. Culver-Stockton 1926, M.A. Iowa 1932, M.D. 1937; *assistant professor emeritus, Preventive Medicine and Environmental Health, 1938 (1971)*

Bourgeacq, Jacques A., M.A. St. Louis 1965, Ph.D. Iowa 1972; *associate professor, French and Italian, 1969 (1976)*

Bourjaily, Vance, B.A. Bowdoin 1944; *professor, English, 1957 (1973)*

Bovbjerg, Richard V., B.S. Chicago 1941, Ph.D. 1949; *professor, Zoology, 1955 (1961)*

Bow, Warren J., B.A. Michigan 1960, M.J. California (Berkeley) 1964; *assistant professor, School of Journalism, 1977*

Bowers, John Waite, B.S. Kansas 1958, M.A. 1959, Ph.D. Iowa 1962; *professor, Speech and Dramatic Art, 1962 (1969)*

Boyd, Willard L., B.S.L. Minnesota 1949, LL.B. 1951, LL.M. Michigan 1952, S.J.D. 1962; *professor, Law, 1954 (1961)*

Boyer, Daniel B., B.A. Iowa 1966, D.D.S. 1970, Ph.D. Polytechnic Institute 1974; *associate professor, Operative Dentistry, 1974 (1978)*

Boyle, John, A.B. Davenport 1953, S.T.B. Rome (Italy) 1955, S.T.L. 1957, Ph.D. New York 1971; *associate professor, School of Religion, 1972 (1977)*

Boyle, Philip F., Jr., D.D.S. Georgetown 1967; *adjunct instructor, Preventive and Community Dentistry, 1976*

Boynton, George R., B.A. Oklahoma Baptist 1957, Ph.D. North Carolina 1964; *professor, Political Science, 1964 (1971)*

Boysen, James F., B.S. Minnesota 1946, B.M. 1947, M.D. 1948; *clinical assistant professor, Pediatrics, 1976*

Bozeman, Theodore D., B.A. Florida Presbyterian 1964, B.D. Union Theological Seminary 1968, Th.M. 1970, Ph.D. Duke 1974; *associate professor, School of Religion and History, 1974 (1978)*

Bozeman, William C., B.A. Huntington 1967, M.Ed. Georgia State University 1971, Ph.D. Wisconsin 1978; *assistant professor, Educational Administration, 1978*

Braaten, Melvin O., B.S. North Dakota State 1956, M.S. 1961, Ph.D. North Carolina State 1965; *adjunct associate professor, Business Administration, 1977*

Bradac, James J., B.S. Northwestern 1965, M.A. 1966, Ph.D. 1970; *associate professor, Speech and Dramatic Art, 1970 (1975)*

Bradbury, James T., B.S. Montana State 1928, M.S. Michigan 1930, Sc.D. 1932; *professor emeritus, Obstetrics and Gynecology, 1952 (1956)*

Braley, Alson E., M.D. Iowa 1931; *professor emeritus, Ophthalmology, 1950 (1969)*

Brand, Richard A., A.B. Oklahoma State 1963, M.D. Baylor 1967; *associate professor, Orthopaedic Surgery and Materials Engineering, 1974 (1978)*

Brandt, Berkeley, B.A. Virginia 1965, M.D. 1970; *assistant professor, Surgery, 1977*

Branson, Dan E., B.C.E. Auburn 1954, M.C.E. 1956, Ph.D. Florida 1960; *professor, Materials Engineering, 1963*

Bratton, Barry D., Ph.D. Michigan State 1975; *assistant professor, Instructional Design and Technology, 1975*

Breder, Hans, *associate professor, School of Art and Art History, 1966 (1971)*

Brenner, Robert L., B.S. City University of New York 1963, M.S. Montana 1964, Ph.D. Missouri 1973; *assistant professor, Geology, 1977*

Breslow, Kenneth, B.S. Brooklyn College of Pharmacy 1970, M.S. Southern California 1973; *clinical assistant professor, Pharmacy, 1975*

Bricker, Dennis L., B.S. Illinois 1965, M.S. 1966, M.S. Northwestern 1972, Ph.D. 1975; *assistant professor, Systems Engineering, 1974*

Brief, Arthur P., B.S. Tennessee 1968, M.S. Wisconsin 1971, Ph.D. 1974; *associate professor, Business Administration, 1975 (1978)*

Bright, Stephen F., B.B.A. Iowa 1968, J.D. 1972, M.B.A. 1973; *instructor, Accounting, 1974*

Brine, Pauline F., B.S. Boston 1954, M.P.H. North Carolina 1960, C.A.G.S. Boston 1962; *associate professor, Dental Hygiene, 1964 (1971)*

Brodbeck, May, B.A. New York 1941, M.A. Iowa 1945, Ph.D. 1947; *Carver professor, Philosophy, 1974*

Brody, Michael J., B.S. Columbia 1956, Ph.D. Michigan 1961; *professor, Pharmacology, 1961 (1969)*

Broffitt, James D., B.A. DePauw 1963, M.S. Colorado State 1965, Ph.D. 1969; *associate professor, Statistics, 1970 (1975)*

Brown, Alicia A., B.A. George Washington 1972, M.A. Iowa 1976; *assistant professor, Physical Education and Dance, 1976 (1978)*

Brown, Anthony L., D.D.S. Iowa 1966; *adjunct instructor, Family Dentistry, 1974*

Brown, Bobby R., B.A. David Lipscomb 1963, M.A. Pennsylvania State 1964, Ph.D. 1969; *associate professor, Instructional Design and Technology, 1973*

Brown, Donald D., B.A. Iowa 1962, M.S. 1965, M.D. 1966; *associate professor, Internal Medicine, 1973 (1978)*

Brown, James C. N., M.B.B.Ch. National University of Ireland 1960, M.S. Iowa 1964; *clinical assistant professor, Psychiatry, 1970*

Brown, John S., B.S. West Texas State 1954, D.D.S. Texas 1958; *assistant professor, Oral Surgery, 1977*

Brown, Joseph D., B.A. Iowa 1955, M.D. 1958; *associate professor, Internal Medicine, 1964 (1969)*

Brown, Lawrence D., B.S. State University of New York 1968, M.B.A. Chicago 1970, Ph.D. Rochester 1975; *assistant professor, Accounting, 1976*

Brown, Louis F., B.A. Coe 1950, M.A. Iowa 1952, Ph.D. 1961; *associate professor, Special Education, 1964 (1968)*

Brown, Merle E., B.A. Michigan 1948, M.A. 1951, Ph.D. 1954; *professor, English, 1967*

Brown, Robert C., B.S. Portland 1946, M.D. Loyola University of Chicago 1948; *professor, Radiology, 1968 (1976)*

Brownstein, Oscar L., B.A. Missouri 1955, M.A. 1956, M.F.A. Yale 1960, Ph.D. Iowa 1963; *professor, Speech and Dramatic Art, 1961 (1974)*

Bruns, Gerald L., B.A. Marquette 1960, M.A. 1962, Ph.D. Virginia 1966; *professor, English, 1970 (1974)*

Bryant, Donald C., B.A. Cornell 1927, M.A. 1930, Ph.D. 1937; *professor emeritus, Speech and Dramatic Art, 1958 (1973)*

Buchanan, Edward B., Jr., B.S. Detroit 1950, M.S. 1954, Ph.D. Iowa State 1959; *associate professor, Chemistry, 1960 (1967)*

Bucher, Kathleen A., B.A. Knox 1973, Ph.D. North Carolina 1977; *assistant professor, Preventive Medicine and Environmental Health, 1977*

Buchsbaum, Herbert J., B.A. New York 1955, M.D. Munich (Germany) 1961; *professor, Obstetrics and Gynecology, 1970 (1975)*

Buckles, Robert E., B.S. California (Berkeley) 1939, M.S. 1940, Ph.D. California (Los Angeles) 1942; *professor, Chemistry, 1945 (1959)*

Buckley, Helen A., A.B. California (Berkeley) 1951, J.D. 1954; *professor, Law, 1974*

Bulechek, Gloria, B.S.N. Iowa 1963, M.A. 1967, Ph.D. 1978; *assistant professor, Nursing, 1963 (1970)*

Bull, Henry B., B.S. South Carolina 1927, M.S. Minnesota 1928, Ph.D. 1930; *professor emeritus, Biochemistry, 1952 (1973)*

Bumsted, Robert M., B.S. Wisconsin 1966, M.D. 1969, M.S. Iowa 1977; *assistant professor, Otolaryngology and Maxillofacial Surgery, 1976 (1977)*

Bundy, Stephen A., B.A. Colorado 1964, M.A. 1967, M.F.A. 1972; *assistant professor, School of Art and Art History, 1973*

Bunge, Raymond G., B.A. Michigan 1932, M.D. 1936; *professor emeritus, Urology, 1941 (1976)*

Burford, Byron L., Jr., B.F.A. Iowa 1942, M.F.A. 1947; *professor, School of Art and Art History, 1949 (1965)*

Burke, George, B.S. Loyola University of Chicago 1954, M.S. Chicago 1956, Ph.D. Missouri 1961; *associate professor, Mathematics, 1961 (1965)*

Burke, Norma P., B.A. Moorhead State 1956, M.A. 1957, Ph.D. Iowa 1965; *associate professor, Physical Education and Dance, 1964 (1978)*

Burman, Arthur C., A.B. Denver 1949, M.A. 1952, Ed.D. Indiana 1959; *professor, Post-Secondary and Continuing Education, 1970*

Burmeister, Leon F., B.S. Iowa State 1964, M.S. 1966, Ph.D. 1972; *associate professor, Preventive Medicine and Environmental Health, 1969 (1977)*

Burns, C. Patrick, B.A. Kansas 1959, M.D. 1963; *associate professor, Internal Medicine, 1971 (1975)*

Burton, Donald J., B.S. Loyola (Maryland) 1956, Ph.D. Cornell 1961; *professor, Chemistry, 1962 (1970)*

Burton, Steven J., B.A. California 1970, J.D. Southern California 1973; *associate professor, Law, 1977*

Burton, Thomas C., B.S. Montana State 1961, M.D. Northwestern 1964; *associate professor, Ophthalmology, 1969 (1974)*

Bush, Archie C., B.A. St. Bonaventure 1962, M.A. Virginia 1964, Ph.D. State University of New York (Buffalo) 1970; *associate professor, Classics, 1969 (1975)*

Buss, William G., B.A. Yale 1955, J.D. Harvard 1960; *professor, Law, 1967 (1970)*

Busse, Geraldine, B.S. Iowa 1940, G.N. Certificate 1940, M.P.H. Minnesota 1952; *assistant professor, Nursing, 1969*

Butchvarov, Panayot, B.A. Robert (Turkey) 1952, M.A. Virginia 1954, Ph.D. 1955; *professor, Philosophy, 1967*

Butler, John E., B.S. Wisconsin State 1961, Ph.D. Kansas 1966; *associate professor, Microbiology, 1971 (1974)*

Butler, John M., M.S. Indiana 1962, M.A. Ball State 1970; *instructor, School of Journalism and Secondary Education, 1971 (1972)*

Cac, Nguyen P., Lic.es-Sci. Saigon (Vietnam) 1958, M.S. London (England) 1961, Ph.D. Cambridge (England) 1965; *professor, Mathematics, 1968 (1972)*

Cadoret, Remi J., A.B. Harvard 1949, M.D. 1953; *professor, Psychiatry and Family Practice, 1973*

Cain, George D., B.S. Sterling 1962, M.S. Purdue 1964, Ph.D. 1968; *associate professor, Zoology, 1970 (1976)*

Caldeira, Greg A., A.B. California State (Stanislaus) 1973, A.M. Princeton 1975; *instructor, Political Science, 1976*

Caldwell, Robert G., B.S. Pennsylvania 1928, M.A. 1934; *professor emeritus, Sociology, 1948*

Camillo, Victor P., Jr., B.A. Bridgeport 1966, Ph.D. Rutgers 1969; *associate professor, Mathematics, 1970 (1974)*

Campbell, Donald J., B.A. New York 1970, M.S. Purdue 1974, Ph.D. 1976; *assistant professor, Business Administration, 1976*

Campbell, Kathryn S., A.B. Kansas 1962, M.A. 1964, Ph.D. Illinois 1973; *assistant professor, English, 1975*

Cancilla, Pasquale, B.S. Manitoba (Canada) 1956, M.D. 1956; *professor, Pathology, 1974*

Cannon, Joseph G., B.S. Illinois 1951, M.S. 1953, Ph.D. 1956; *professor, Pharmacy, 1962 (1965)*

Canter, Arthur, B.A. Iowa 1946, M.A. 1948, Ph.D. 1950; *professor, Psychiatry, 1960 (1965)*

Cantor, Gordon N., B.A. Syracuse 1950, M.A. 1951, Ph.D. Iowa 1954; *professor, Educational Psychology, Measurement and Statistics, 1960 (1963)*

Cantor, Joan H., B.A. Syracuse 1951, M.A. Iowa 1953, Ph.D. 1954; *associate professor, Psychology, 1960 (1967)*

Capettini, Robert J., B.B.A. Toledo 1966, M.B.A. 1968, Ph.D. Illinois 1975; *assistant professor, Accounting, 1974*

Caplan, Richard M., B.S. Iowa State 1949, M.A. Iowa 1951, M.D. 1955; *professor, Dermatology, 1961 (1969)*

Caputo, James F., B.S. Puget Sound 1968, Ph.D. Washington State 1974; *assistant professor, Pharmacy, 1974*

Carew, David P., B.S. Massachusetts College of Pharmacy 1952, M.S. 1954, Ph.D. Connecticut 1958; *professor, Pharmacy, 1957 (1965)*

Carey, James W., B.S. Rhode Island 1957, M.S. Illinois 1959, Ph.D. 1963; *Gallup professor, School of Journalism, 1976*

Carlsen, George R., B.A. Minnesota 1938, B.S. 1940, M.A. 1944, Ph.D. 1948; *professor, English and Secondary Education, 1958*

Carlson, David E., B.S. Iowa 1966, M.S. 1970; *clinical assistant professor, Pharmacy, 1977*

Carlson, Richard R., Ph.B. Chicago 1943, B.S. 1945, M.S. 1948, Ph.D. 1951; *professor, Physics and Astronomy, 1951 (1963)*

Carlson, Wayne R., B.A. Rockford 1962, M.A. Indiana 1966, Ph.D. 1968; *associate professor, Botany, 1968 (1973)*

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Carpenter, Raymon T., B.S. Kansas 1954, M.S. 1956, Ph.D. Northwestern 1962; *associate professor, Physics and Astronomy, 1962 (1965)*

Carter, Dianne K., B.A. California (Berkeley) 1959, M.A. Utah 1968, Ph.D. 1971; *assistant professor, Counselor Education, 1971*

Carter, Guy, B.A. DePauw 1963, M.D. Indiana 1967; *assistant professor, Pediatrics, 1973 (1974)*

Carter, Irl E., B.A. Parsons 1955, B.D. Drake 1960, M.A. Iowa 1965; *associate professor, School of Social Work, 1967 (1976)*

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Casady, Donald Rex, B.S.P.E. Iowa 1950, M.A. 1955, Ph.D. 1959; *professor, Physical Education, 1958 (1969)*

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Catalano, Cosmo A., B.A. Allegheny 1950, M.F.A. Yale 1953; *professor, Speech and Dramatic Art, 1966 (1975)*

Cater, E. David, B.S. Trinity 1954, Ph.D. Kansas 1960; *associate professor, Chemistry, 1961 (1967)*

Caudill, George G., M.D. Iowa 1952; *clinical assistant professor, Pediatrics, 1975*

Cazin, John, Jr., B.S. North Carolina 1952, M.S. 1954, Ph.D. 1957; *professor, Microbiology, 1957 (1972)*

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Chalkley, G. Roger, B.A. Oxford (England) 1961, M.A. 1962, D.Phil. 1964; *professor, Biochemistry, 1967 (1973)*

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Chambers, George A., B.A. Iowa State Teachers 1954, M.A. 1958, Ph.D. Iowa 1964; *professor, Educational Administration, 1963 (1970)*

Champion, Craig M., B.S. Iowa State 1958, M.D. Iowa 1962; *clinical assistant professor, Family Practice and Internal Medicine, 1973*

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Chandramouli, B., M.B.B.S. Mysore (India) 1960; *clinical assistant professor, Pediatrics, 1971 (1976)*

Chapler, Frederick K., B.A. California (Berkeley) 1957, M.D. California (San Francisco) 1960; *professor, Obstetrics and Gynecology, 1970 (1976)*

Chappell, Ann A., B.A. Jersey City State 1972, M.A. Iowa 1975; *instructor, Nursing, 1976*

Charlton, Thomas H., B.A. Toronto 1960, Ph.D. Tulane 1966; *associate professor, Anthropology, 1967 (1969)*

Chaves, Enrique, B.S. East Central State 1959, M.D. Oklahoma 1963; *assistant professor, Pediatrics and Neurology, 1975*

Chen, Ching-Jen, Diploma Taipei Institute of Technology (Taiwan) 1957, M.S. Kansas State 1962, Ph.D. Case Institute of Technology 1967; *professor, Energy Engineering, 1967 (1977)*

Cheng, Frank H., B.S. St. John's (China) 1946, M.S. Tennessee 1950, Ph.D. Indiana 1957; *associate professor, Radiology, 1964 (1969)*

Cheng, Hsi, B.A. Yencing (China) 1948, M. Litt. Cambridge (England) 1963; *professor, East Asian Languages and Literature, 1965 (1973)*

Chermprapai, B., B.S. Syracuse 1959, M.A. Columbia 1965; *instructor, Nursing, 1974*

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Choo, Chunghi, B.F.A. Ewha Women's (Taiwan) 1961, M.F.A. Cranbrook Academy of Art 1965; *associate professor, School of Art and Art History, 1968 (1973)*

Chou, David C., B.S. National Taiwan 1960, M.S. Iowa 1963, Ph.M. Yale 1968, Ph.D. 1968; *associate professor, Energy Engineering, 1969 (1972)*

Chow, Kenneth C., M.D. Saskatchewan (Canada) 1964; *assistant professor, Radiology, 1978*

Christensen, James, B.A. Nebraska 1953, M.D. 1957; *professor, Internal Medicine, 1963 (1972)*

Christie, James H., B.S. Franklin and Marshall 1942, M.D. Western Reserve 1945; *professor, Radiology, 1968*

Christy, Teresa E., B.S. Manhattanville 1949, M.S. DePaul 1957, Ed.D. Columbia 1968; *professor, Nursing, 1974 (1975)*

Chung, Raphael S., B.S. Hong Kong 1959, M.B. 1964; *associate professor, Surgery, 1973 (1977)*

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Clamon, Gerald H., B.S. Dartmouth 1967, M.D. Washington (Missouri) 1971; *assistant professor, Internal Medicine, 1976 (1977)*

Clancy, John, L.M. Coombe Hospital (Ireland) 1947, M.D. University College Dublin (Ireland) 1945, M.B.B.Ch. National (Ireland) 1946; *professor, Psychiatry, 1959 (1966)*

Clark, Jane E., B.S. New York 1968, M.S. Washington 1970, Ph.D. Wisconsin 1976; *assistant professor, Physical Education and Dance, 1976*

Clark, Kenneth F., B.Sc. Durham (England) 1956, M.S. New Mexico 1962, Ph.D. 1966; *professor, Geology, 1971 (1978)*

Clark, William G., B.A. Iowa 1947, M.A. 1949, Ph.D. Denver 1960; *associate professor, Rhetoric and English, 1968*

Clarke, William R., B.A. Oregon 1964, M.S. Iowa 1967, Ph.D. 1975; *assistant professor, Preventive Medicine and Environmental Health, 1964*

Clarkson, Brian H., B.Ch.D., L.D.S. Leeds (England) 1966, M.S. Rochester 1968, Ph.D. London (England) 1976; *assistant professor, Pedodontics, 1976*

Claussen, Donald H., B.A. Wartburg 1965, M.S.W. Nebraska 1970; *adjunct instructor, School of Social Work, 1978*

Clements, William M., B.A. Alabama 1965, B.D. Union Theological Seminary (New York) 1969, Ph.D. School of Theology at Claremont 1972; *assistant professor, Family Practice, 1975*

Clifford, Margaret M., B.S. Alverno 1961, M.S. Wisconsin 1968, Ph.D. 1970; *associate professor, Educational Psychology, Measurement and Statistics, 1970 (1973)*

Clifton, James A., B.A. Vanderbilt 1944, M.D. 1947; *professor, Internal Medicine, 1953 (1963)*

Clinton, Robert N., A.B. Michigan 1968, J.D. Chicago 1971; *associate professor, Law, 1973 (1976)*

Close, James P., B.S. Bradley 1969, M.A. Ball State 1973; *assistant professor, Aerospace Military Studies, 1977*

Clow, Toni J., B.S.N. Iowa 1966, M.A. 1975; *assistant professor, Nursing, 1976 (1978)*

Coble, Rollo J., B.A. Kansas 1950, M.D. 1954; *assistant professor, Family Practice, 1973*

Coblin, Weldon S., B.A. Washington 1967, Ph.D. 1972; *associate professor, East Asian Languages and Literature, 1973 (1978)*

Cochran, Edwin M., D.D.S. Iowa 1973; *adjunct instructor, Family Dentistry, 1974*

Cochran, Grace, B.A. Swarthmore 1917, Ph.D. Iowa 1930, M.D. Yale 1941; *professor emerita, French and Italian, 1930 (1956)*

Cochran, Lida, B.A. Washburn 1934, B.A. Central Washington State 1960, M.A. 1960; *associate professor, Instructional Design and Technology, 1961 (1977)*

Coffman, Robert E., B.S. Illinois 1953, M.S. California (Berkeley) 1955, Ph.D. Minnesota 1964; *associate professor, Chemistry, 1967 (1972)*

Coffman, William E., B.S. Wittenberg 1934, M.A. West Virginia 1938, Ed.D. Columbia 1949; *E.F. Lindquist professor, Educational Psychology, Measurement and Statistics, 1969*

Cohen, Loren H., B.A. Harvard 1965, M.D. Iowa 1969; *assistant professor, Internal Medicine, 1975 (1976)*

Colangelo, Nicholas, B.A. State University of New York (Cortland) 1970, M.Ed. Vermont 1973, Ph.D. Wisconsin 1977; *assistant professor, Counselor Education, 1977*

Collins, Paul J., D.D.S. Iowa 1966, M.S. 1973; *assistant professor, Periodontics, 1969 (1974)*

Collins, Richard J., D.D.S. Loyola 1962; *adjunct instructor, Family Dentistry, 1974*

Collins, Steve M., B.S. Illinois (Chicago Circle) 1971, M.S. 1974, Ph.D. 1977; *assistant professor, Information Engineering, 1976 (1977)*

Collison, Kathleen, B.A. Iowa 1968, M.S.W. 1970; *adjunct instructor, School of Social Work, 1978*

Condon, Catherine J., M.D. Marquette 1963; *clinical associate professor, Internal Medicine, 1975*

Conkwright, Nelson, B.A. Kentucky 1922, M.A. Illinois 1924, Ph.D. 1926; *professor emeritus, Mathematics, 1926 (1967)*

Conlon, Donald J., D.D.S. Iowa 1957; *adjunct assistant professor, Pedodontics, 1977*

Conner, John W., B.S. Creighton 1950, M.A. Iowa 1962, Ph.D. 1966; *associate professor, Secondary Education, 1967 (1970)*

Connor, Robert J., B.S. West Virginia 1967, D.D.S. 1971, M.S. Iowa 1974; *assistant professor, Family Dentistry, 1972 (1976)*

Conway, Rochelle J., B.A. Iowa 1972, M.A. 1975; *instructor, Home Economics, 1975*

Conway, Thomas W., B.S. St. Thomas 1953, M.A. Texas 1955, Ph.D. 1962; *professor, Biochemistry, 1964 (1973)*

Cook, David A., B.A. Oberlin 1967, M.A. Iowa 1974, Ph.D. 1976; *instructor, Psychology, 1976*

Cook, Robert T., A.B. Kansas 1958, M.D. 1962, Ph.D. 1967; *associate professor, Pathology, 1977*

Coolidge, Archibald C., B.A. Harvard 1951, M.A. Brown 1954, Ph.D. 1956; *professor, English, 1956 (1974)*

Cooney, James, Jr., B.A. Loras 1965, M.S.W. Illinois 1970; *adjunct instructor, School of Social Work, 1978*

Cooper, George, IV, B.A. Williams 1964, M.D. Cornell 1968; *assistant professor, Internal Medicine, 1977*

Cooper, Reginald R., B.A. West Virginia 1952, B.S. 1953, M.D. Medical College of Virginia 1955, M.S. Iowa 1960; *professor, Orthopaedic Surgery, 1962 (1971)*

Cooper, Steven H., D.D.S. Iowa 1966, M.S. 1970; *adjunct assistant professor, Periodontics, 1970 (1972)*

Corbett, James J., B.A. Brown 1962, M.D. Chicago 1966; *assistant professor, Neurology, 1977*

Corbett, Richard B., A.B. Georgia State 1967, B.B.A. 1968, M.B.A. 1970, Ph.D. 1974; *assistant professor, Business Administration, 1976*

Corder, Michael, B.S. Capital 1963, M.D. Ohio State 1965; *associate professor, Internal Medicine, 1975 (1978)*

Cordier, Hubert V., B.A. Manchester 1939, M.A. Michigan State 1942, Ph.D. Illinois 1954; *professor, Speech and Dramatic Art, 1968*

Cornell, Steven H., B.S. Michigan 1950, M.D. 1953; *professor, Radiology, 1963 (1971)*

Correy, Maurice A., D.D.S. Iowa 1960; *adjunct instructor, Preventive and Community Dentistry*

Corry, Robert J., A.B. Yale 1957, M.D. Johns Hopkins 1961; *professor, Surgery, 1973 (1976)*

Coryell, William H., B.S. Georgia 1970, M.D. Medical College of Georgia 1973; *assistant professor, Psychiatry, 1977 (1978)*

Cossman, George W., A.B. Shimer 1952, B.S. Illinois 1954, M.Ed. 1955, Ph.D. Iowa 1967; *associate professor, Secondary Education, 1966 (1970)*

Costantino, Anthony, A.B. Cornell 1931, LL.B. 1936, Ph.D. California (Berkeley) 1956; *professor emeritus, Economics, 1956 (1978)*

Couch, Carl J., B.A. Iowa 1951, M.A. 1954, Ph.D. 1955; *associate professor, Sociology, 1965*

Couchman, Mary E., B.S. Simmons 1944, M.D. Yale 1949; *clinical assistant professor, Family Practice and Pediatrics, 1972*

Couchman, Phillip G., B.S. Harvard 1945, M.D. Yale 1949, Ed.S. Iowa 1973; *clinical assistant professor, Family Practice, 1972 (1973)*

Coucouvanis, Dimitri, B.S. Allegheny 1963, Ph.D. Case Institute of Technology 1967; *professor, Chemistry, 1968 (1975)*

Cowart, Andrew T., B.A. Georgia 1967, M.A. 1968, Ph.D. Michigan 1971; *associate professor, Political Science, 1974 (1976)*

Cox, Charles D., B.S. William and Mary 1967, Ph.D. Georgia 1971; *assistant professor, Microbiology, 1974*

Cox, Jeffrey L., B.A. Rice 1970, A.M. Harvard 1971, Ph.D. 1978; *assistant professor, History, 1977 (1978)*

Cox, John Bridgeford, B.S. Northwest Missouri State 1938, M.A. Iowa 1950; *assistant professor, Educational Administration, 1960*

Crabb, Larry J., D.D.S. Baylor 1958; *assistant professor, Family Dentistry, 1977*

Craft, John Leonard, B.S. Iowa 1968, M.A. 1970, Ph.D. 1971; *assistant professor, School of Social Work, 1977*

Craig, Allen T., B.A. Florida 1927, M.A. 1928, Ph.D. Iowa 1931; *professor emeritus, Statistics, 1931 (1970)*

Craig, Dee Wayne, A.B. William and Mary 1968, Ed.M. West Chester State 1970, Ed.D. Temple 1976; *assistant professor, Recreation Education, 1975*

Crain, Jack L., B.S. Arkansas 1966, M.D. 1966; *clinical assistant professor, Obstetrics and Gynecology, 1974*

Cram, Albert E., B.S. Nebraska 1965, M.D. 1969; *assistant professor, Surgery, 1975 (1976)*

Crane, Frederick, B.A. Carleton 1949, M.A. Iowa 1956, Ph.D. 1960; *associate professor, School of Music, 1968*

Crawford, Irving P., A.B. Stanford 1951, M.D. 1955; *professor, Microbiology, 1977*

Cremers, Bernard J., B.S.P.H. Iowa 1964; *clinical instructor, Pharmacy, 1976*

Cress, Joseph N., A.B. St. Louis 1968, M.A. Southern Illinois 1972, Ph.D. 1974; *adjunct instructor, School of Social Work, 1977*

Croley, Thomas E., B.C.E. Ohio State 1969, M.S. 1970, Ph.D. Colorado State 1972; *associate professor, Energy Engineering, 1972 (1976)*

Cross, Lowell M., B.A. Texas Tech 1963, M.A. Toronto (Canada) 1968; *associate professor, School of Music, 1972 (1976)*

Cross, Norma, B.M. Iowa 1941, M.F.A. 1942; *associate professor, School of Music, 1948 (1956)*

Crouch, Norman A., B.S. Wisconsin 1962, M.S. 1966, Ph.D. 1969; *assistant professor, Microbiology, 1972*

Crowe, Raymond R., B.A. Vanderbilt 1963, M.D. 1966; *associate professor, Psychiatry, 1972 (1977)*

Crowell, Carolyn M., B.S.N. Iowa 1966, M.N. Washington 1968; *assistant professor, Nursing, 1968 (1969)*

Crowninshield, Roy D., B.S. Vermont 1971, M.S. 1973, Ph.D. 1975; *adjunct assistant professor, Materials Engineering, 1975*

Cruden, Robert W., A.B. Hiram 1958, M.S. Ohio State 1960, Ph.D. California (Berkeley) 1967; *professor, Botany, 1967 (1978)*

Cruikshank, Brenda, B.A. DePauw 1964, M.D. North Carolina 1967; *assistant professor, Pediatrics, 1972 (1976)*

Cruikshank, Dwight P., A.B. Duke 1965, M.D. 1969; *assistant professor, Obstetrics and Gynecology, 1976*

Cryer, Jonathan D., B.A. DePauw 1961, Ph.D. North Carolina 1966; *associate professor, Statistics, 1966 (1970)*

Culp, David A., B.S. Bucknell 1941, M.D. Jefferson Medical College of Philadelphia 1944; *professor, Urology, 1951 (1961)*

Cummins, Phillip D., B.A. Iowa 1957, M.A. 1959, Ph.D. 1961; *professor, Philosophy, 1963 (1974)*

Cunning, Barbara R., B.S. Ohio State 1961, M.A. Iowa 1972; *assistant professor, Nursing, 1972*

Curry, David J., B.S. Colorado 1967, M.B.A. 1968, Ph.D. California (Berkeley) 1973; *associate professor, Business Administration, 1972 (1977)*

Curtis, James F., B.A. Iowa State Teachers 1935, M.A. Iowa 1940, Ph.D. 1942; *professor, Speech Pathology and Audiology, 1946 (1951)*

Cuttler, Charles D., B.F.A. Ohio State 1935, M.A. 1937, Ph.D. New York 1952; *professor, School of Art and Art History, 1957 (1965)*

Dague, Richard R., B.S. Iowa State 1959, M.S. 1960, Ph.D. Kansas 1967; *professor, Energy Engineering, 1975*

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Damasio, Antonio J., M.D. Lisbon (Portugal) 1968, Ph.D. 1974; *associate professor, Neurology, 1975*

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D'angelo, Nicola, D.R. Rome (Italy) 1953, 1955; *professor, Physics and Astronomy, 1976*

Daniels, Jessie S., B.S.N. Iowa 1972, M.A. 1976; *instructor, Nursing, 1974*

Danielson, Deborah J., B.S.N. Northeast Missouri State 1974, M.A. Iowa 1976; *instructor, Nursing, 1977*

D'Antonio, Louis J., B.S. Fordham 1968, M.B.S. Ohio 1970, Ph.D. Colorado 1978; *assistant professor, Business Administration, 1978*

Dave, Bhasker J., M.D. Bombay (India) 1967; *clinical instructor, Psychiatry, 1975*

Davidson, Charles W., B.S.B.A. Ohio State 1947, J.D. 1949, LL.M.Michigan 1950; *professor, Law, 1950 (1957)*

Davies, J. Leonard, B.A. Upper Iowa 1929, M.A. 1943, Ph D. 1949; *associate professor emeritus, Postsecondary and Continuing Education, 1949 (1976)*

Davis, Carl S., B.A. Cornell 1961, M.Ed. St. Lawrence 1966, Ph.D. Syracuse 1973; *associate professor, Counselor Education, 1973 (1977)*

Davis, Julia M., B.A. Louisiana 1951, M.S. Mississippi 1965, Ph.D. Southern Mississippi 1966; *associate professor, Speech Pathology and Audiology, 1971 (1975)*

Davis, Lane, B.A. Kansas 1941, M.A. Cornell 1948, Ph.D. 1950; *professor, Political Science, 1949 (1964)*

Davis, Leodis, B.S. Missouri 1956, M.S. Iowa State 1958, Ph.D. 1960; *professor, Chemistry, 1968 (1976)*

Davis, M. Francine, B.S.N. North Carolina 1972, M.P.H. 1974; *instructor, Nursing, 1974*

Davis, Thomas L., B.M.Ed. Northwestern 1957, M.M. 1958; *professor, School of Music, 1958 (1974)*

Dawson, David C., B.S.E.E. Pittsburgh 1966, Ph.D. 1971; *assistant professor, Physiology and Biophysics, 1973*

Dawson, Helen L., B.S. Shurtleff 1926, M.S. Washington (Missouri) 1929, Ph.D. 1932; *professor emerita, Anatomy, 1932 (1969)*

Dayton, Charles S., B.S. Iowa 1969; *clinical instructor, Pharmacy, 1974*

Dean, H. L., B.A. West Virginia 1929, M.S. Iowa 1931, Ph.D. 1936; *associate professor emeritus, Botany, 1945 (1975)*

Dechasca, Edmund, B.A. Wooster 1928, M.A. California (Los Angeles) 1929, Ph.D. Chicago 1941; *professor emeritus, Spanish and Portuguese, 1953 (1971)*

Dedmon, Howard W., B.S. Texas Christian 1960, D.D.S. Iowa 1964, M.S. 1977; *assistant professor, Family Dentistry, 1972 (1977)*

Deegan, James Wayne, B.A.M.E. Iowa 1934, M.S.I.E. 1935; *professor, Systems Engineering, 1949 (1953)*

Degowin, Elmer L., B.A. Michigan 1923, M.D. 1928; *professor emeritus, Internal Medicine, 1932 (1969)*

Degowin, Richard L., M.D. Chicago 1959; *professor, Internal Medicine and Radiology, 1968 (1973)*

Degravelles, William, B.S. Southwestern Louisiana Institute 1949, M.D. Tulane 1952; *clinical assistant professor, Orthopaedic Surgery, 1964*

Dekock, Henry C., B.A. Central (Iowa) 1926, M.A. Iowa 1934; *professor emeritus, Educational Administration, 1948 (1969)*

Dekock, William H., B.A. Iowa 1960, D.D.S. 1963; *adjunct associate professor, Orthodontics, 1967 (1973)*

Deligiorgis, Stavros, B.A. Athens (Greece) 1960, M.A. Yale 1958, Ph.D. California (Berkeley) 1966; *professor, English, 1965 (1973)*

Delworth, Ursula M., B.A. California State (Long Beach) 1956, M.A. California State (Los Angeles) 1962, Ph.D. Oregon 1969; *professor, Counselor Education, 1976*

Demello, George, B.A. Massachusetts 1954, M.A. Colorado 1959, Ph.D. 1968; *associate professor, Spanish and Portuguese, 1967 (1970)*

Denburg, Jeffrey L., B.A. Amherst 1965, Ph.D. Johns Hopkins 1970; *assistant professor, Zoology, 1977*

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Dent, Warren T., B.Ec. (Hons.) Australian National 1965, M.Ec. Adelaide (Australia) 1966, Ph.D. Minnesota 1971; *Professor, Economics And Statistics, 1971 (1977)*

Deprosse, Charles A., A.B. Cornell 1946, M.D. 1950, M.P.H. California (Berkeley) 1972; *associate professor, Obstetrics and Gynecology, 1972 (1978)*

Depuma, Richard D., B.A. Swarthmore 1964, M.A. Bryn Mawr 1967, Ph.D. 1969; *associate professor, School of Art and Art History, 1968 (1974)*

de Saint Victor, Carol, B.A. Indiana 1956, Ph.D. 1966; *associate professor, English, 1966 (1971)*

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Dettmer, Helena R., B.A. Indiana 1972, Ph.D. Michigan 1976; *assistant professor, Classics, 1976*

Deutelbaum, Wendy, B.A. Northwestern 1969, Ph.D. New York 1977; *assistant professor, French and Italian, 1975 (1977)*

Dhaliwal, Dan S., B.S. California State 1968, M.S. 1971, M.A. Arizona 1975, Ph.D. 1977; *assistant professor, Accounting, 1977*

Diamond, James G., B.A. Holy Cross 1963, M.D. Georgetown 1967; *assistant professor, Ophthalmology, 1974 (1975)*

Dibona, Gerald F., B.A. Harvard 1960, M.D. Tufts 1964; *professor, Internal Medicine, 1969 (1975)*

Dick, Fred R., B.A. Iowa 1963, M.D. 1967; *associate professor, Pathology, 1974 (1978)*

Dick, Robert W., B.S. Drake 1965, M.S. Iowa 1972; *assistant professor, Pharmacy, 1966 (1973)*

Diehl, Paul B., B.A. Texas 1966, M.A. 1970, Ph.D. 1976; *assistant professor, English, 1975*

Dilg, John, B.F.A. Rhode Island School of Design 1969; *assistant professor, School of Art and Art History, 1975*

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Dobrian, Walter, B.A. Wisconsin 1952, Ph.D. 1960; *associate professor, Spanish and Portuguese, 1962 (1965)*

Doering, John V., B.A. Regis 1966, D.D.S. Iowa 1970, M.A. 1976; *assistant professor, Family Dentistry, 1974 (1976)*

Doherty, William J., B.A. St.Paul's 1968, M.A. Connecticut 1974; *instructor, Home Economics, 1977*

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Donahue, Mary P., B.S.N. Ohio State 1962, M.S.N. 1971; *assistant professor, Nursing, 1976*

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Donham, Kelley J., B.S. Iowa 1966, M.S. 1970, D.V.M. Iowa State 1971; *associate professor, Preventive Medicine and Environmental Health, 1973 (1978)*

Donta, Sam T., B.S. Allegheny 1959, M.D. Albert Einstein Medicine 1963; *professor, Internal Medicine, 1971 (1978)*

Dorfman, Donald, B.A. Pennsylvania 1954, M.A. Michigan 1957, Ph.D. 1961; *professor, Psychology, 1968 (1974)*

Dorfman, Lorraine T., B.S. Temple 1957, M.A. Michigan 1959; *instructor, Home Economics, 1969 (1973)*

Doty, Donald B., A.B. Stanford 1959, M.D. 1962; *professor, Surgery, 1971 (1976)*

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Dowler, Dellarose, M.S.W. Tennessee 1959; *adjunct instructor, School of Social Work, 1973*

Downing, Donald T., B.S.C. Western Australia 1951, Ph.D. 1955; *professor, Dermatology, 1978*

Doyle, John R., B.S. Massachusetts Institute of Technology 1949, M.S. 1952, Ph.D. Tulane 1955; *professor, Chemistry, 1955 (1965)*

Dragstedt, Lester R., B.S., M.S. Northwestern 1950, M.D. 1953; *clinical associate professor, Surgery, 1968*

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Dryer, Robert L., B.S. Iowa 1943, M.S. 1947, Ph.D. 1949; *professor, Biochemistry, 1954 (1968)*

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Duerlinger, James P., B.A. Wisconsin 1961, M.A. Washington 1963, Ph.D. Wisconsin 1966; *associate professor, Philosophy, 1971*

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Dunlap, Rhodes, B.A. Rice Institute 1931, M.A. 1932, B.Litt. Oxford (England) 1938, D.P. 1939; *professor, English, 1938 (1953)*

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Eckhardt, Richard D., A.B. Illinois 1940, M.D. Harvard 1943; *professor, Internal Medicine, 1949 (1960)*

Eckstein, John W., B.S. Loras 1946, M.D. Iowa 1950; *professor, Internal Medicine, 1954 (1965)*

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Edwards, Warren P., *adjunct assistant professor, Psychiatry, 1977*

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Elbert, Dennis A., B.S. Iowa 1973; *clinical instructor, Pharmacy, 1976*

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Erenberg, Allen, M.D. Illinois 1967; *associate professor, Pediatrics, 1974 (1978)*

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Erickson, John E., B.A. Barrington 1962, M.S. Illinois 1967, Ph.D. 1973; *associate professor, School of Journalism, 1976*

Ertl, Wolfgang, B.A. Philipps (Germany) 1969, M.A. New Hampshire 1970, Ph.D. Pennsylvania 1975; *assistant professor, German, 1977*

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Espinosa, Henry, A.A. Long Beach City 1965, D.D.S. Creighton 1971; *adjunct instructor, Family Dentistry, 1973 (1974)*

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Farnoush, Ali, D.M.D. Tehran (Iran) 1968, M.S. Iowa 1974; *assistant professor, Periodontics, 1974 (1976)*

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Fehling, Fred L., B.A. Wartburg 1926, M.A. Iowa 1930, Ph.D. 1938; *professor emeritus, German, 1930 (1973)*

Feiss, Michael G., B.S. Utah 1963, M.S. Illinois 1965, Ph.D. Washington 1969; *associate professor, Microbiology, 1972 (1977)*

Feld, Ronald D., B.S. Massachusetts 1968, Ph.D. Wisconsin 1974; *assistant professor, Pathology, 1976*

Feldbush, Thomas L., B.S. Mount Union 1961, M.S. Ohio State 1964, Ph.D. 1966; *associate professor, Microbiology and Urology, 1971 (1974)*

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Ferguson, Richard L., B.S. Indiana University of Pennsylvania 1962, M.A. Western Michigan 1966, Ph.D. Pittsburgh 1969; *adjunct assistant professor, Educational Psychology, Measurement and Statistics, 1975*

Fernandez, Oscar, A.B. Washington (Missouri) 1937, M.A. 1940, Ph.D. Wisconsin 1953; *professor, Spanish and Portuguese, 1967*

Fernandez-Barros, E., J.D. Havana (Cuba) 1954, Ph.D. 1955, Ph.D. Miami 1968; *associate professor, Spanish and Portuguese, 1967 (1970)*

Fethke, Carol C., A.B. Wellesley 1964, M.A. Iowa 1966, Ph.D. 1971; *assistant professor, Home Economics, 1975*

Fethke, Gary C., B.A. Iowa 1964, Ph.D. 1968; *associate professor, Business Administration, 1974*

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Field, Howard, B.A. St. Olaf 1956, D.D.S. Marquette 1964, M.P.H. Harvard 1969; *associate professor, Preventive and Community Dentistry, 1973*

Filer, Lloyd J., B.S. Pittsburgh 1941, Ph.D. 1944, M.D. Rochester 1952; *Mead Johnson professor, Pediatrics, 1965*

Fincham, Richard W., B.S. Iowa 1953, M.D. 1956; *professor, Neurology, 1963 (1975)*

Finn, Richard, B.A. Iowa 1950, M.A. 1952, M.D. 1959; *associate professor, Psychiatry, 1963 (1971)*

Fischer, Lawrence J., B.S. Illinois 1959, M.S. 1961, Ph.D. California (Los Angeles) 1965; *professor, Pharmacology, 1968 (1976)*

Fisher, Alton K., D.D.S. Marquette 1935, B.S. Loyola (Louisiana) 1948; *professor emeritus, Oral Pathology and Diagnosis and Anthropology, 1949 (1974)*

Fisher, Neil B., B.S.C.E. Iowa 1951, M.S. 1954; *assistant professor, Energy Engineering, 1951 (1956)*

Fisher, Peter S., B.A. Haverford 1968, M.A. Missouri 1972; *instructor, Urban and Regional Planning, 1977*

Fitch, Robert M., B.A.E. Florida 1959, M.Ed. 1961, Ph.D. Iowa 1965; *professor, Secondary Education, 1966 (1976)*

Fitz, Annette, B.A. Iowa 1954, M.D. 1958; *professor, Internal Medicine, 1963 (1976)*

Fix, John D., B.S. Purdue 1963, A.M. Indiana 1967, Ph.D. 1969; *associate professor, Physics and Astronomy, 1969 (1974)*

Flanagan, Douglas R., B.S. Michigan 1967, M.S. 1969, Ph.D. 1971; *associate professor, Pharmacy, 1978*

Flatt, Adrian Ede, B.A. Cambridge (England) 1942, M.B.B.Chir. London Hospital Medical 1946, M.A. Cambridge (England) 1947, M.D. 1951, F.R.C.S. Royal College of Physicians and Surgeons (England) 1953; *professor, Orthopaedic Surgery and Anatomy, 1956 (1966)*

Fleck, Arthur C., B.S. Western Michigan 1959, M.A. Michigan State 1960, Ph.D. 1964; *professor, Computer Science, 1965 (1972)*

Flickinger, M. K., B.A. Drake 1929, M.A. Iowa 1930, Ph.D. 1935; *assistant professor emeritus, Classics, 1966 (1976)*

Flood, Sue A., B.S. Iowa 1972, M.A. 1974; *instructor, Recreation Education, 1977*

Foley, Walter J., B.Ed. Chicago Teachers 1957, M.Ed. 1961, Ph.D. Illinois 1964; *professor, Educational Administration, 1965 (1970)*

Folk, G. Edgar, Jr., B.A. Harvard 1937, M.A. 1940, Ph.D. 1947; *professor, Physiology and Biophysics, 1953 (1965)*

Folkins, John W., B.A. Redlands 1970, M.S. 1971, Ph.D. Washington 1976; *assistant professor, Speech Pathology and Audiology, 1977*

Folsom, Lowell E., B.A. Ohio Wesleyan 1969, M.A. Rochester 1972, Ph.D. 1976; *assistant professor, English and American Studies Program, 1976*

Fomon, Samuel J., B.A. Harvard 1947, M.D. Pennsylvania 1947; *professor, Pediatrics, 1954 (1961)*

Forell, Elizabeth J., B.A. St. Olaf 1944, M.A. Iowa 1959; *instructor, Educational Psychology, Measurement and Statistics, 1964 (1974)*

Forell, George W., B.D. Lutheran Theological Seminary 1942, Th.M. Princeton 1943, Th.D. Union Theological Seminary 1949; *Carver Professor, School of Religion, 1954 (1961)*

Forkenbrock, David J., B.A. Minnesota 1965, M.U.P. Wayne State 1973, Ph.D. Michigan 1977; *assistant professor, Urban and Regional Planning, 1978*

Forker, E. Lee, B.S. Haverford 1953, M.D. Pittsburgh 1957; *professor, Internal Medicine, 1963 (1973)*

Forsyth, Robert A., B.S. St. Vincent 1959, M.A. Kent State 1963, Ph.D. Iowa 1967; *professor, Educational Psychology, Measurement and Statistics, 1965 (1974)*

Foster, Charles T., Jr., B.A. California (Santa Barbara) 1971, M.A. Johns Hopkins 1974, Ph.D. 1975; *assistant professor, Geology, 1978*

Foster, Stephen C., B.A. Northern Illinois 1967, M.A. Illinois 1969, Ph.D. Pennsylvania 1973; *assistant professor, School of Art and Art History, 1974*

Fowler, Richard C., B.A. DePauw 1963, M.D. Iowa 1967; *assistant professor, Psychiatry, 1974*

Fowles, Don C., B.S. Massachusetts Institute of Technology 1961, M.A. Harvard 1965, Ph.D. 1967; *associate professor, Psychology, 1970 (1973)*

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Fox, Stephen S., B.S. Pennsylvania 1955, M.A. Michigan 1957, Ph.D. 1960; *professor, Psychology, 1965 (1971)*

Foxley, Cecelia H., B.A. Utah State 1964, M.A. Utah 1965, Ph.D. 1968; *associate professor, Counselor Education, 1971 (1976)*

Fracassini, S. Carl, B.F.A. Denver 1936, M.F.A. Iowa 1951; *professor emeritus, School of Art and Art History, 1956 (1971)*

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Franck, Fred, B.A. University of Northern Iowa 1971, M.S.W. Iowa 1973; *adjunct instructor, School of Social Work, 1971*

Franck, Phyllis M., B.S.N. Iowa 1958, M.A. 1968; *assistant professor, Nursing, 1968 (1970)*

Frank, Alan R., B.A. California (Los Angeles) 1963, M.A. California State 1965, Ph.D. Iowa 1970; *associate professor, Special Education, 1970 (1973)*

Frank, Clyde W., B.S. Northeast Missouri State Teachers 1962, Ph.D. Kansas State 1966; *professor, Chemistry, 1966 (1976)*

Frank, Louis A., B.A. Iowa 1960, M.S. 1961, Ph.D. 1964; *professor, Physics and Astronomy, 1964 (1971)*

Frank, Roslyn M., B.A. Iowa 1961, M.A. 1963, Ph.D. 1972; *associate professor, Spanish and Portuguese, 1968 (1978)*

Frankel, Joseph; B.A. Cornell 1956, Ph.D. Yale 1960; *professor, Zoology, 1962 (1971)*

Franklin, Wayne, B.A. Union 1967, Ph.D. Pittsburgh 1972; *associate professor, English, 1973 (1977)*

Frantz, Rita, B.S.N. Marycrest 1970, M.A. Iowa 1973, Ph.D. 1978; *assistant professor, Nursing, 1972 (1978)*

Freel, Mildred I., B.S.N. Minnesota 1961, M.Ed. 1962; *associate professor, Nursing, 1962 (1977)*

Freeman, Richard, B.S. Redlands 1955, M.D. Stanford 1959; *professor, Internal Medicine, 1966 (1974)*

Friedrich, H. Bruce, B.A. Wartburg 1958, M.S. Iowa 1961, Ph.D. 1963; *professor, Chemistry, 1966 (1976)*

Friedrich, Rose M., B.S.N. Iowa 1961, M.A. 1973; *assistant professor, Nursing, 1973*

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Fuller, Kristin M., M.S.W. Iowa 1968; *adjunct instructor, School of Social Work, 1976*

Fumerton, Richard, B.A. Toronto (Canada) 1971, M.A. Brown 1973, Ph.D. 1974; *assistant professor, Philosophy, 1974*

Funk, David C., B.S. Emory 1944, M.D. 1946; *associate professor, Internal Medicine, 1953 (1961)*

Furner, Beatrice A., B.S. State University of New York 1960, M.A. Iowa 1963, Ph.D. 1967; *professor, Early Childhood and Elementary Education, 1964 (1975)*

Furnish, William M., B.A. Iowa 1934, M.S. 1935, Ph.D. 1938; *professor emeritus, Geology, 1953 (1977)*

Gal, Emery Martin, M.Sc. Peter Pazmany (Hungary) 1935, Ph.D. 1937, M.D. 1939; *professor, Psychiatry, 1961 (1965)*

Galagan, Donald J., D.D.S. Iowa 1937, M.P.H. California School of Public Health 1950; *professor, Preventive and Community Dentistry, 1966*

Galask, Rudolph P., A.A. Fort Dodge 1954, B.A. Drake 1959, M.S. Iowa 1967, M.D. 1964; *professor, Obstetrics and Gynecology and Microbiology, 1970 (1978)*

Gallagher, Daniel G., B.A. Boston State 1972, M.A. Illinois 1974, Ph.D. 1977; *assistant professor, Business Administration, 1977*

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Gangeness, Leonard G., B.S. Minnesota 1943, B.S. North Dakota 1949, M.D. Illinois 1951; *clinical assistant professor, Pediatrics, 1976*

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Gardiner, Cynthia P., A.B. Bryn Mawr 1963, M.A. Princeton 1970, Ph.D. 1970; *assistant professor, Classics, 1972*

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Gardner, Thomas V., B.S. Pittsburgh 1955, D.D.S. 1955; *associate professor, Oral Surgery, 1974*

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Gauron, Eugene F., A.B. Creighton 1957, M.A. Illinois 1959, Ph.D. Catholic 1962; *professor, Psychiatry, 1962 (1974)*

Gebhart, Gerald F., B.S. Illinois 1967, M.S. Iowa 1969, Ph.D. 1971; *associate professor, Pharmacology, 1973 (1977)*

Gelfand, Lawrence E., A.B. Western Reserve 1949, M.A. 1950, Ph.D. Washington 1958; *professor, History, 1962 (1966)*

Gelfand, Miriam J., B.A. St. Johns (China) 1946; *instructor, Russian, 1962 (1972)*

Geraghty, Michael A., B.S. Notre Dame 1952, Ph.D. 1959; *associate professor, Mathematics, 1964 (1965)*

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Gerbert, Elaine T., B.A. California (Berkeley) 1966, M.A. Illinois 1971; *instructor, East Asian Languages and Literature, 1976*

Gergis, Samir D., M.B.Ch.B. Cairo (Egypt) 1954, D.A. 1957, M.D. 1962, D.A. Copenhagen (Denmark) 1963; *professor, Anesthesia, 1969 (1976)*

Gerken, Kathryn C., B.S. Southern Illinois 1962, M.A. Bradley 1967, Ph.D. Southern Illinois 1973; *associate professor, Special Education, 1973 (1978)*

Gero, Anne, B.A. Marycrest 1974, M.S.W. Iowa 1976; *assistant professor, School of Social Work, 1976 (1978)*

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Gittler, Josephine, B.A. Barnard 1965, J.D. Northwestern 1968; *professor, Law, 1973 (1977)*

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Glenister, Brian F., B.Sc. Western Australia 1948, M.S. Melbourne (Australia) 1953, Ph.D. Iowa 1956; *Miller professor, Geology, 1959 (1966)*

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Godwin, Robert F., B.A. Iowa 1963, M.D. 1966; *clinical assistant professor, Dermatology, 1976*

Goeken, James, A.B. Chicago 1967, M.D. Missouri 1972; *assistant professor, Pathology, 1976 (1977)*

Goertz, Christoph K., Diplom Physiker Technische Universität Berlin (Germany) 1969, Ph.D. Rhodes 1972; *associate professor, Physics and Astronomy, 1973 (1977)*

Goff, Harold M., B.S. Missouri 1969, M.A. 1971, Ph.D. Texas 1976; *assistant professor, Chemistry, 1976*

Goff, Lewin A., B.A. Oklahoma 1941, M.F.A. 1946, Ph.D. Western Reserve 1948; *professor, Speech and Dramatic Art, 1973*

Goldman, James, B.A. Iowa 1960, M.A. 1962; *adjunct instructor, School of Social Work, 1978*

Goldstein, Helen T., B.A. Chicago 1948, A.M. Radcliffe 1951, Ph.D. 1956; *assistant professor, School of Religion, 1968*

Goldstein, Jonathan A., A.B. Harvard 1950, A.M. 1951, Ph.D. Columbia 1959; *professor, History, 1962 (1970)*

Good, W. Stanley, A.B. Nebraska Wesleyan 1937, M.S.S.W. Nebraska 1948; *associate professor, School of Social Work, 1966*

Goodrich, John E., D.D.S. Loyola 1950; *adjunct assistant professor, Preventive and Community Dentistry, 1969*

Goplerud, Clifford P., M.D. Iowa 1948; *professor, Obstetrics and Gynecology, 1958 (1966)*

Gordon, David F., A.B. Western Reserve 1958, M.D. New York 1962; *clinical assistant professor, Internal Medicine, 1973*

Gormezano, Isidore, A.B. New York 1952, A.M. Wisconsin 1957, Ph.D. 1958; *professor, Psychology, 1966*

Gould, Marjorie L., B.S.N. Iowa 1939, M.S. Boston 1947; *associate professor, Nursing, 1967 (1969)*

Graf, Carl J., B.A. Canisius 1937, M.D. State University of New York (Buffalo) 1941; *professor, Surgery, 1967 (1968)*

Graf, William L., B.A. Wisconsin 1969, M.S. 1971, Ph.D. Wisconsin (Madison) 1974; *associate professor, Geography, 1974 (1978)*

Graff, Ronald J., B.F.A. Kansas City Art Institute 1973, M.F.A. Yale 1975; *assistant professor, School of Art and Art History, 1975 (1978)*

Gram, Moltke S., B.A. Indiana 1960, Ph.D. 1965; *professor, Philosophy, 1970 (1976)*

Granner, Daryl K., B.A. Iowa 1958, M.S. 1962, M.D. 1962; *professor, Internal Medicine and Biochemistry, 1970 (1975)*

Grant, Christine, Dipl. Dumferline (Scotland) 1956, B.A. Iowa 1970, Ph.D. 1974; *assistant professor, Physical Education and Dance, 1971*

Grant, John E., A.B. Harvard 1951, A.M. 1954, Ph.D. 1960; *professor, English, 1965*

Grant, Stanley C., B.A. Coe 1953, M.A. Wyoming 1954, Ph.D. Idaho 1971; *adjunct professor, Geology, 1975*

Gray, Jerry L., B.S. Missouri 1963, M.Ed. 1965, Ph.D. Arizona 1969; *associate professor, Educational Psychology, Measurement and Statistics, 1969 (1975)*

Gray, Stuart C., B.A. Iowa 1955, M.A. 1956, Ph.D. 1961; *associate professor, Secondary Education, 1962 (1968)*

Greenough, Paul R., B.S. Columbia 1968, M.A. Chicago 1970, Ph.D. 1977; *assistant professor, History, 1974*

Greenwald, Stanley W., B.A. Grinnell 1955, M.D. Iowa 1959; *clinical assistant professor, Obstetrics and Gynecology, 1975*

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Grigsby, William R., D.D.S. Missouri 1960, Ph.D. Virginia Commonwealth 1970; *associate professor, Periodontics, 1973*

Grimlund, Richard A., B.S. Washington 1959, M.B.A. 1974, Ph.D. 1977; *assistant professor, Accounting, 1978*

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Grissom, Felix E., B.S. Shaw 1963, M.S. North Carolina State 1971, Ph.D. 1974; *assistant professor, Physiology and Biophysics, 1977*

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Gross, Cordell E., B.S. Florida 1965, M.S. 1967, M.D. 1971; *assistant professor, Surgery, 1977*

Gross, Erwin G., B.S. Wisconsin 1917, M.S. 1919, Ph.D. 1921, M.D. Iowa 1930; *professor emeritus, Pharmacology, 1929 (1960)*

Guiang, Sixto, M.D. Santo Tomas (Phillipines) 1951; *clinical assistant professor, Pediatrics, 1975*

Guillory, J. Keith, B.S. Loyola (Louisiana) 1956, M.S. Wisconsin 1960, Ph.D. 1961; *professor, Pharmacy, 1964 (1971)*

Gurll, Nelson J., A.B. California (Berkeley) 1963, M.D. California (San Francisco) 1963; *assistant professor, Surgery, 1976*

Gurnett, Donald A., B.S. Iowa 1962, M.S. 1963, Ph.D. 1965; *professor, Physics and Astronomy, 1965 (1972)*

Gussin, Gary N., B.S. Michigan 1961, Ph.D. Harvard 1966; *associate professor, Zoology, 1969 (1974)*

Haaland, Carl J., B.S. Iowa State 1954, M.A. Southern California 1971; *professor, Military Science, 1975*

Hacker, David A., A.B. Notre Dame 1966, Ph.D. Iowa 1972; *assistant professor, Linguistics, 1974*

Hackett, Dean E., B.Mus. Northwestern 1949, M.A. 1950; *assistant professor, School of Social Work, 1972*

Haefner, John., B.A. Iowa 1935, M.A. 1939, Ph.D. 1941; *professor, Secondary Education, 1941 (1954)*

Hahn, Oscar A., Prof., Chile 1963, M.A. Iowa 1972, Ph.D. Maryland 1977; *assistant professor, Spanish and Portuguese, 1977*

Haines, Don R., B.M. Illinois Wesleyan 1959, M.M. Eastman School of Music 1961, D.M.A. Rochester 1973; *associate professor, School of Music, 1974 (1978)*

Hale, Charles A., B.A. Amherst 1951, M.A. Minnesota 1952, Diplome Strasbourg (France) 1953, Ph.D. Columbia 1957; *professor, History, 1966 (1970)*

Hale, Merle L., D.D.S. Iowa 1938, B.A. 1948, M.S. 1948; *professor, Oral Surgery, 1952*

Hall, Daniel L., D.D.S. Iowa 1959, M.S 1974; *associate professor, Family Dentistry, 1972 (1976)*

Hall, H. Douglas, B.S. Iowa 1966, D.D.S. 1970; *clinical instructor, Family Dentistry, 1975*

Hall, Margaret S., B.A. Smith 1938, M.F.A. Iowa 1951; *associate professor, Speech and Dramatic Art, 1951 (1974)*

Hall, Penelope J., B.A. Iowa 1965, M.A. 1967; *assistant professor, Speech Pathology and Audiology, 1968 (1975)*

Hallberg, George R., A.B. Augustana 1970, Ph.D. Iowa 1975; *adjunct professor, Geology, 1976*

Halmi, Katherine A., B.A. Iowa 1961, M.D. 1965; *associate professor, Psychiatry, 1972 (1976)*

Halmi, Nicholas S., M.D. Budapest (Hungary) 1947; *professor, Anatomy and Physiology and Biophysics, 1950 (1958)*

Hamilton, David B., A.B. Amherst 1961, M.A. Virginia 1964, Ph.D. 1968; *associate professor, English, 1975*

Hamilton, Henry E., B.S. Iowa 1939, M.D. 1941; *professor, Internal Medicine, 1949 (1959)*

Hammond, Harold L., D.D.S. Loyola University of Chicago 1962, M.S. Chicago 1967; *associate professor, Oral Pathology and Diagnosis, 1967 (1972)*

Hankenson, Richard R., M.D. Iowa 1969; *clinical assistant professor, Internal Medicine, 1973 (1977)*

Hanley, John M., B.A. Western Montana 1967, M.A. Montana 1972; *instructor, Speech Pathology and Audiology, 1977*

Hanneman, Ronald H., B.A. Iowa 1960, D.D.S. 1963, M.S. 1968; *adjunct assistant professor, Orthodontics, 1970*

Hansell, Sven H., B.F.A. Pennsylvania 1956, M.A. Harvard 1958, Ph.D. Illinois 1966; *associate professor, School of Music, 1973 (1978)*

Hansen, Gary F., B.A. Iowa 1957, M.A. 1959, Ph.D. 1964; *associate professor, Physical Education and Secondary Education, 1962 (1969)*

Hanson, James W., M.D. Iowa 1969; *assistant professor, Pediatrics, 1976*

Hanson, Jay G., D.D.S. Iowa 1952; *assistant professor, Removable Prosthodontics, 1974*

Hanson, Randall R., B.S. Iowa State 1965, M.D. Iowa 1969; *clinical assistant professor, Internal Medicine, 1974 (1977)*

Hardin, Robert C., B.S. Iowa 1935, M.D. 1937; *professor, Internal Medicine, 1945 (1950)*

Hardt, Hanno R. E., M.A. Southern Illinois 1963, Ph.D. 1967; *professor, School of Journalism, 1968 (1974)*

Hardy, James C., B.S. Northeast Missouri State Teachers 1951, M.A. Iowa 1957, Ph.D. 1961; *professor, Speech Pathology and Audiology and Pediatrics, 1961 (1969)*

Harker, Lee A., B.A. Iowa 1961, M.D. 1964; *associate professor, Otolaryngology and Maxillofacial Surgery, 1970 (1974)*

Harlow, John S., B.A. Princeton 1935, J.D. Harvard 1939; *professor, Business Administration, 1957 (1964)*

Harper, Dennis C., B.A. Augustana 1964, M.A. Iowa 1966, Ph.D. 1972; *associate professor, Pediatrics, 1972 (1978)*

Harper, John B., A.B. Stanford 1962, M.B.A. Iowa 1966; *instructor, English, 1976*

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Harris, James L., B.S. Georgia Institute of Technology 1941, M.Arch. Harvard 1950, M.C.P. 1952; *professor, Urban and Regional Planning, 1967 (1972)*

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Harris, Richard R., B.A. Coe 1970, M.S. Iowa 1973, Ph.D. 1974; *adjunct assistant professor, Oral Pathology and Diagnosis, 1977*

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Hartman, Gerhard, B.A. Buffalo 1932, M.B.A. 1935, Ph.D. Chicago 1942; *professor, Hospital and Health Administration, 1946*

Hartman, Sharlene, B.S.N. Iowa 1961, M.A. 1970; *adjunct instructor, Nursing, 1976*

Harvey, John A., A.B. Chicago 1955, Ph.D. 1959; *professor, Psychology, 1968*

Haug, Edward J., B.S. Missouri 1962, M.S. Kansas 1964, Ph.D. Kansas State 1966; *professor, Materials Engineering, 1968 (1976)*

Hausler, William J., B.A. Kansas 1951, M.A. 1953, Ph.D. 1958; *associate professor, Preventive Medicine and Environmental Health and Oral Pathology and Diagnosis, 1958 (1966)*

Hawkins, David B., B.A. Wake Forest 1971, M.A. Memphis State 1974, Ph.D. Northwestern 1977; *assistant professor, Speech Pathology and Audiology, 1977*

Hawley, Ellis W., B.A. Wichita 1950, M.A. Kansas 1951, Ph.D. Wiconsin 1959; *professor, History, 1969*

Hawtrey, Charles E., B.A. Grinnell 1957, M.D. Iowa 1961; *professor, Urology, 1969 (1977)*

Hay, James G., Dip.P.E. Otago (New Zealand) 1956, M.A. Iowa 1965, Ph.D. 1967; *professor, Physical Education, 1971 (1978)*

Hayden, Hermine, B.S. Michigan 1956, M.P.H. 1961; *assistant professor, Dental Hygiene, 1974 (1975)*

Hayes, Charles, B.A. Augustana 1967, M.A. Iowa 1969, Ph.D. 1970; *assistant professor, Pediatrics, 1971 (1973)*

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Hayreh, Sohan S., M.B.B.S. Panjab (India) 1951, M.S. 1959, F.R.C.S. Royal College of Surgeons (England) 1969, Ph.D. London (England) 1965; *professor, Ophthalmology, 1973*

Healy, Alfred, B.S. Notre Dame 1956, M.A. Iowa 1957, M.D. 1963; *associate professor, Pediatrics and Special Education, 1967 (1972)*

Heath, Edward C., B.S. St. Louis 1949, M.A. Missouri 1951, Ph.D. Purdue 1955; *professor, Biochemistry, 1976*

Heckel, Philip H., B.A. Amherst 1960, Ph.D. Rice 1966; *professor, Geology, 1971 (1978)*

Hedden, Steven K., B.M.E. Kansas 1964, M.M.E. 1969, Ph.D. 1971; *associate professor, Secondary Education, 1972 (1975)*

Hedges, Arthur C., B.S. Creighton 1967, M.S. Iowa 1972; *clinical assistant professor, Pharmacy, 1974*

Hedlund, Steven K., B.S. Iowa Wesleyan 1964, D.D.S. Iowa 1968; *adjunct clinical instructor, Fixed Prosthodontics, 1973*

Heffner, Ray L., A.B. Yale 1948, M.A. 1950, Ph.D. 1953, Litt.D. Franklin 1966, LL.D. Rhode Island 1967, D.B.A. Bryant 1967; *professor, English, 1963*

Hege, John H., A.B. Gettysburg 1938, M.D. Hahnemann Medical 1943, LL.B. Blackstone College of Law 1954; *clinical assistant professor, Psychiatry, 1974*

Hegmann, Joseph P., B.S. Illinois 1962, M.S. 1965, Ph.D. 1968; *professor, Zoology, 1968 (1977)*

Heick, Merle A., B.S.N. Iowa 1960, M.Ed. Minnesota 1963; *assistant professor, Nursing, 1960 (1963)*

Heidger, Paul M., B.A. Northern Colorado 1963, Ph.D. Tulane 1967; *associate professor, Anatomy, 1974*

Heim, Connie G., B.S.N. Pennsylvania State 1970, M.A. Iowa 1977; *instructor, Nursing, 1975*

Hein, Herman A., B.A. Wartburg 1959, M.D. Iowa 1963; *associate professor, Pediatrics, 1973 (1976)*

Heistad, Donald, B.S. Chicago 1959, M.D. 1963; *professor, Internal Medicine, 1970 (1976)*

Helling, Dennis K., B.S. St. Louis College of Pharmacy 1971, Pharm.D. Cincinnati 1973; *associate professor, Pharmacy, 1973 (1978)*

Helm, June, Ph.B. Chicago 1944, A.M. 1949, Ph.D. 1958; *professor, Anthropology, 1960 (1967)*

Helms, Charles M., A.B. Cornell 1964, Ph.D. Rochester School of Medicine 1969, M.D. Rochester 1971; *assistant professor, Internal Medicine, 1976*

Helscher, John, D.D.S. Iowa 1971; *adjunct instructor, Operative Dentistry, 1973*

Heltne, David R., B.S. Iowa 1967, M.S. 1969; *instructor, Systems Engineering, 1974*

Hendeles, Leslie S., Pharm.D. Southern California 1969; *associate professor, Pharmacy, 1972 (1978)*

Henderson, Marcia L., B.S.N. Marycrest 1972, M.A. Iowa 1973; *adjunct instructor, Nursing, 1976*

Hendrix, Stephen D., B.S. Florida State 1969, Ph.D. California (Berkeley) 1975; *assistant professor, Botany, 1975*

Henkin, Alan B., B.S. Alabama 1962, M.A. 1963, Ph.D. 1967, Ph.D. Wisconsin 1972; *assistant professor, Postsecondary and Continuing Education, 1975*

Henn, Fritz A., B.A. Connecticut Wesleyan 1963, Ph.D. Johns Hopkins 1967, M.D. Virginia 1971; *associate professor, Psychiatry, 1974 (1978)*

Henneman, John B., B.A. Princeton 1957, M.A. Harvard 1961, Ph.D. 1966; *professor, History, 1969 (1973)*

Hepler, Charles D., B.S. Connecticut 1960, M.S. Iowa 1965, Ph.D. 1973; *assistant professor, Pharmacy, 1966 (1974)*

Hering, Robert G., B.S.M.E. Illinois 1956, M.S.M.E. Southern California 1958, Ph.D. Purdue 1961; *professor, Energy Engineering, 1971*

Herlitzka, Alfred J., B.S. Wisconsin 1947, M.D. 1951; *clinical assistant professor, Surgery, 1974*

Hermsmeyer, R. Kent, A.B. Missouri 1963, M.S. Illinois 1966, Ph.D. 1968; *associate professor, Pharmacology, 1973 (1975)*

Hernadi, Paul Z., Ph.D. Vienna 1963, Ph.D. Yale 1967; *professor, English, 1975*

Herrick, P. W., D.D.S. Iowa 1922; *professor emeritus, Fixed Prosthodontics, 1944 (1967)*

Herron, Theresa, B.S. Kansas 1973, M.A. Iowa 1976; *instructor, Nursing, 1976*

Hershkowitz, Noah, B.S. Union (New York) 1962, Ph.D. Johns Hopkins 1966; *professor, Physics and Astronomy, 1967 (1976)*

Hertko, Edward J., B.S. Illinois (Chicago Circle) 1952, M.D. Illinois 1954; *clinical assistant professor, Internal Medicine, 1977*

Hervig, Richard B., B.A. Augustana 1939, M.A. Iowa 1941, Ph.D. 1947; *professor, School of Music, 1947 (1963)*

Heschke, Richard J., B.S. Concordia Teachers 1961, M.M. Eastman School of Music 1962, D.M.A. 1965; *associate professor, School of Music, 1977*

Hess, John, B.S. Iowa 1939, M.D. 1941; *assistant professor, Family Practice, 1975*

Hesse, Charles F., B.S. Iowa State 1958, M.D. Iowa 1962; *clinical assistant professor, Obstetrics and Gynecology, 1975*

Hethcote, Herbert W., B.S. Colorado 1964, M.A. Michigan 1965, Ph.D. 1968; *associate professor, Mathematics, 1969 (1973)*

Hettmansperger, Sue E., B.F.A. New Mexico 1972, M.F.A. 1974; *instructor, School of Art and Art History, 1977*

Hibbard, William A., B.M. New England Conservatory 1961, M.M. 1963, Ph.D. Iowa 1967; *professor, School of Music, 1966 (1977)*

Hierholzer, Walter J., B.A. Albion 1956, M.D. Yale 1961; *associate professor, Internal Medicine and Preventive Medicine and Environmental Health, 1976*

Hieronymus, Albert N., B.Ed. Illinois State 1939, M.A. Iowa 1946, Ph.D. 1948; *professor, Educational Psychology, Measurement and Statistics, 1948 (1959)*

Higa, Leslie, B.A. Grinnell 1953, D.D.S. Missouri 1960, M.S. Chicago 1967; *professor, Oral Surgery and Oral Pathology and Diagnosis, 1965 (1978)*

Hill, John D., B.S. Wayne State 1950, M.M. Indiana 1956, Ph.D. Kansas 1968; *Professor, School of Music, 1963 (1975)*

Hill, Lee F., M.D. Harvard 1920; *clinical professor emeritus, Pediatrics, 1961*

Hill, Murray W., B.D.Sc. Western Australia 1967, M.Sc. London (England) 1972, Ph.D. 1976; *assistant professor, Oral Pathology and Diagnosis, 1977*

Hillman, Robert A., A.B. Rochester 1969, J.D. Cornell 1972; *professor, Law, 1974 (1978)*

Hills, Elmer W., B.A. Nebraska 1909, J.D. Chicago 1914; *professor emeritus, Business Administration, 1919 (1955)*

Hills, Thomas W., B.A. Iowa 1965, M.A. 1967; *adjunct instructor, Counselor Education, 1970 (1974)*

Hindes, Charles A., B.F.A. Illinois 1966, M.F.A. Rhode Island School of Design 1968; *associate professor, School of Art and Art History, 1973 (1977)*

Hines, N. William, A.B. Baker 1958, LL.B. Kansas 1961; *professor, Law, 1962 (1967)*

Hinrichs, James V., B.A. Iowa 1963, A.M. Stanford 1964, Ph.D. 1967; *professor, Psychology, 1967 (1978)*

Hitchcock, Orville A., B.A. Pennsylvania State 1931, M.A. Iowa 1932, Ph.D. 1936; *professor emeritus, Speech and Dramatic Art, 1946 (1976)*

Ho, Aichen Ting, B.A. Tunghai (Taiwan) 1962, M.R.E. New York Theological Seminary 1964, M.A. Brown 1966, Ph.D. Wisconsin 1971; *assistant professor, East Asian Languages and Literature, 1972*

Hoak, John C., B.S. Lebanon Valley 1951, M.D. Hahnemann Medical 1955; *professor, Internal Medicine, 1963 (1970)*

Hobbs, Gary W., B.S. Michigan State 1972, M.A. Southern Illinois 1975, Ph.D. 1977; *assistant professor, Counselor Education, 1977*

Hockmuth, Richard E., B.A. Iowa 1955, M.D. 1958; *clinical assistant professor, Surgery, 1973*

Hoffman, Adeline M., M.A. Columbia 1935, Ph.D. Pennsylvania State 1956; *professor emerita, Home Economics, 1962 (1976)*

Hoffmann, Louis G., B.A. Wesleyan 1953, M.S. Johns Hopkins 1958, S.C.D. 1960; *professor, Microbiology, 1964 (1973)*

Hogben, C. Adrian M., B.S. Wisconsin 1941, M.D. 1943, Ph.D. Minnesota 1950; *professor, Physiology and Biophysics, 1961*

Hogg, Robert V., B.A. Illinois 1947, M.S. Iowa 1948, Ph.D. 1950; *professor, Statistics, 1948 (1962)*

Hohle, Raymond H., A.B. Nevada 1954, M.S. Oregon 1956, Ph.D. 1961; *associate professor, Psychology, 1961 (1965)*

Holcomb, Richard L., B.S. Iowa State 1933, M.A. Iowa 1936; *associate professor, Bureau of Police Science, 1945*

Holstein, Jay A., A.B. Temple 1960, M.A. Hebrew Union 1966, Ph.D. 1970; *associate professor, School of Religion, 1970 (1976)*

Holtsmark, Erling B., B.A. California (Berkeley) 1959, Ph.D. 1963; *associate professor, Classics, 1963 (1969)*

Holtum, Edwin A., B.A. Augustana 1968, M.S. Illinois 1971; *adjunct assistant professor, School of Library Science, 1973 (1976)*

Holz, John W., *instructor, Military Science, 1977*

Holzaepfel, Norman R., B.S. Michigan 1941, M.A. Colorado State 1948; *associate professor, Physical Education and Division of Continuing Education, 1948 (1961)*

Honey, Rex D., B.A. California (Riverside) 1967, M.A. Minnesota 1969, Ph.D. 1972; *associate professor, Geography, 1974 (1978)*

Hood, Albert B., B.A. New Hampshire 1951, Ed.D. Cornell 1957; *professor, Counselor Education, 1965*

Hood, Joyce E., B.S. Abilene Christian 1956, M.A. Iowa 1959, Ph.D. 1965; *associate professor, Educational Psychology, Measurement and Statistics, 1968 (1975)*

Hootman, Richard S., B.A. Coe 1947, M.A. Iowa 1951; *assistant professor, Rhetoric and English, 1967*

Hoover, Hiram D., B.S. Illinois State 1963, M.A. Iowa 1964, Ph.D. 1969; *associate professor, Educational Psychology, Measurement and Statistics, 1967 (1973)*

Hoppin, Richard A., B.A. Minnesota 1943, M.A. 1947, Ph.D. California Institute of Technology 1951; *professor, Geology, 1951 (1961)*

Horen, Jeffrey H., B.A. Michigan 1971, M.A. Yale 1974, Ph.D. 1976; *assistant professor, Business Administration, 1976*

Hornsby, Jessie L., B.A. Toronto (Canada) 1939, M.A. 1949, Ph.D. 1956; *professor, French and Italian, 1956 (1973)*

Hornsby, Roger A., B.A. Western Reserve 1949, M.A. Princeton 1951, Ph.D. 1952; *professor, Classics, 1954 (1967)*

Hornung, Theodore G., *instructor, Military Science, 1977*

Horowitz, Alan J., B.A. Harvard 1967, M.D. Duke 1971, Ph.D. 1973; *assistant professor, Psychiatry, 1976*

Horsley, A. W., B.S. Southern California 1950, M.D. Iowa 1955; *clinical associate professor, Internal Medicine, 1972*

Horton, Philip S., B.A. Iowa 1947, D.D.S. 1950, M.S. 1971; *associate professor, Oral Pathology and Diagnosis, 1969 (1977)*

Horwitz, Henry G., B.A. Haverford 1959, Ph.D. Oxford (England) 1963; *professor, History, 1963 (1970)*

Horwitz, Richard P., B.A. Pennsylvania 1971, M.A. 1972, Ph.D. 1975; *assistant professor, American Studies Program, 1977*

Hovey, Alma B., B.A. Iowa 1921, M.A. 1923; *assistant professor emerita, English, 1923 (1960)*

Howe, Clifford E., B.A. Iowa 1949, M.A. 1953, Ph.D. 1958; *professor, Special Education, 1966 (1968)*

Howe, Donald F., B.A. Iowa 1964, D.D.S. 1967, M.S. 1973; *assistant professor, Fixed Prosthodontics, 1971 (1973)*

Howe, Henry F., B.A. Earlham 1968, M.A. Michigan 1969, Ph.D. 1977; *assistant professor, Zoology, 1978*

Howe, Joseph W., B.E. Iowa 1924, M.S. 1925; *professor emeritus, Energy Engineering, 1929 (1970)*

Howlett, Julie A., B.D.S. London (England) 1971, M.S. 1973; *adjunct instructor, Oral Pathology and Diagnosis, 1976*

Hsu, Hsi Fan, B.S. Amoy (China) 1929, D.Sc. Neuchatel (Switzerland) 1935, M.D. University of the Philippines 1948; *professor emeritus, Preventive Medicine and Environmental Health, 1954 (1974)*

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Huang, Ray-Chong, B.S.C.E. National Taiwan 1968, M.S.C.E. 1970, M.S. Iowa 1974, Ph.D. 1976; *assistant professor, Materials Engineering, 1978*

Hubbard, Philip G., B.S.E.E. Iowa 1946, M.S. 1949, Ph.D. 1954; *professor, Energy Engineering, 1945 (1959)*

Hubbell, Stephen P., B.A. Carleton 1963, Ph.D. California (Berkeley) 1969; *associate professor, Zoology, 1974*

Hubel, Kenneth A., B.A. Rochester 1950, M.D. Cornell 1954; *professor, Internal Medicine, 1962 (1973)*

Huber, Lawrence, D.D.S. Creighton 1960; *instructor, Fixed Prosthodontics and Removable Prosthodontics, 1971 (1973)*

Hudgens, Carolyn M., B.S.N. Iowa 1972, M.A. 1975; *instructor, Nursing, 1975*

Hughes, Lowell R., B.A. Ohio Wesleyan 1950, M.Ph. Johns Hopkins 1965, M.D. Ohio State 1954; *associate professor, Obstetrics and Gynecology, 1965 (1970)*

Hulbary, Robert L., B.A. Illinois 1939, Ph.D. Columbia 1944; *professor, Botany, 1946 (1961)*

Hunnicutt, Benjamin K., B.A. North Carolina 1967, M.A. 1972, Ph.D. 1975; *assistant professor, Recreation Education, 1975 (1976)*

Hunsicker, Lawrence G., B.A. Yale 1959, M.D. Columbia 1963; *associate professor, Internal Medicine, 1976*

Hunter, Elizabeth, B.S. Iowa 1970, M.S. 1974; *assistant professor, Dental Hygiene, 1974*

Huntley, John F., B.A. Chicago 1948, B.A. Michigan 1950, M.A. Connecticut 1952, Ph.D. Chicago 1961; *professor, English, 1957 (1973)*

Hurn, John E., B.S. Northeastern Oklahoma State 1963, M.S. Oklahoma State 1967, Ed.D. 1975; *assistant professor, Instructional Design and Technology, 1977*

Hurtig, Richard R., B.A. New York 1965, M.A. 1973, M.Phil. Columbia 1974, Ph.D. 1974; *assistant professor, Speech Pathology and Audiology and Psychology, 1976*

Huston, Paul E., B.S. Purdue 1926, M.A. Harvard 1928, Ph.D. Iowa 1934, Ph.D. Harvard 1937, M.D. Yale 1939; *professor emeritus, Psychiatry, 1940 (1971)*

Hwang, Sun-tak, B.S. Seoul National (Korea) 1958, M.S. Iowa 1962, Ph.D. 1965; *professor, Materials Engineering, 1966 (1973)*

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Ingram, Walter R., B.A. Grinnell 1926, M.S. Iowa 1928, Ph.D. 1929; *professor emeritus, Anatomy, 1936 (1973)*

Ionasescu, Victor V., M.D. Bucharest (Romania) 1951, Private Docent 1957; *professor, Pediatrics, 1968 (1976)*

Irwin, Orvis C., A.B. Baldwin Wallace 1914, M.A. Columbia 1924, Ph.D. Ohio State 1929; *professor emeritus, Child Behavior and Development, 1931 (1959)*

Irwin, W.R., B.A. Grinnell 1936, M.A. Columbia 1937, Ph.D. 1941; *professor, English, 1947 (1962)*

Isacson, Edwin P., B.S. Nebraska 1950, M.S. 1951, M.D. 1955; *professor, Preventive Medicine and Environmental Health, 1972*

Ishmael, Don E., B.E.E.E. Pratt Institute 1971, M.S.B.A. Boston 1975; *assistant professor, Military Science, 1976*

Iso-Ahola, Seppo E., B.S. Jyvaskyla (Finland) 1971, M.S. Illinois 1972, M.S. Jyvaskyla (Finland) 1973; Ph.D. Illinois 1976; *assistant professor, Recreation Education, 1976*

Isserstedt, Glenn A., B.S. Coe 1964, M.S. Iowa 1969; *instructor, Radiology, 1968*

Jackson, Donald F., B.A. Niagara 1962, M.A. Indiana 1964, Ph.D. 1967; *associate professor, Classics, 1967 (1973)*

Jackson, Herbert L., B.A. Kansas State Teachers 1943, M.S. Wisconsin 1950, Ph.D. 1952; *professor, Radiology, 1960 (1970)*

Jackson, Robert A., B.A. St. Ambrose 1963, M.A. Aquinas Institute of Theology 1967, M.S.W. Iowa 1974; *assistant professor, School of Social Work, 1975*

Jacobs, H. Lee, B.A. Culver-Stockton 1926, M.A. Chicago 1930, B.D. Chicago Theological Seminary 1935, Ph.D. Iowa 1961; *associate professor emeritus, Medicine, 1957 (1970)*

Jacobs, Richard M., D.M.D. Maximillian (Germany) 1948, D.D.S. New York 1952, Ph.D. Virginia 1952, M.P.H. California (Berkeley) 1961, M.S. Illinois 1965; *professor, Orthodontics, 1966*

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Jacobsen, Glenn D., B.A. Luther 1959, M.S. North Dakota 1963, Ph.D. 1965, D.D.S. Iowa 1976; *adjunct assistant professor, Dental Hygiene, 1966 (1977)*

Jacobson, Neil S., B.A. Wisconsin 1972, Ph.D. North Carolina 1977; *assistant professor, Psychology, 1977*

Jacoby, Charles G., B.S. St. Joseph's 1965, M.D. Temple 1969; *assistant professor, Radiology, 1976*

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Jeffers, Coleman, B.A. Berea 1949, M.A. Iowa 1951, Ph.D. 1954; *associate professor, Spanish and Portuguese, 1965*

Jeffers, James R., B.B.A. Iowa 1960, Ph.D. Tulane 1966; *professor, Economics, 1963 (1974)*

Jenkins, Richard L., B.A. Stanford 1925, M.D. Rush 1930; *professor emeritus, Psychiatry, 1961 (1971)*

Jenni, Donald, B.M. DePaul 1958, A.M. Chicago 1962, D.M.A. Stanford 1966; *professor, School of Music, 1968 (1975)*

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Jochimsen, Peter R., A.B. Ripon 1961, M.D. Marquette 1965; *associate professor, Surgery, 1974 (1978)*

Johns, Richard, B.S. Ball State 1961, M.A. 1965; *instructor, School of Journalism and Secondary Education, 1968 (1973)*

Johnson, Alan K., B.S. Pennsylvania State 1964, M.A. Temple 1966, Ph.D. Pittsburgh 1970; *associate professor, Psychology, 1973 (1978)*

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Johnson, Charles F., B.A. California (Santa Barbara) 1957, M.D. California (Los Angeles) 1961; *professor, Pediatrics, 1967 (1977)*

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Johnson, George F., B.A. Park 1963, Ph.D. Iowa State 1969; *associate professor, Pathology, 1976*

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Johnson, William, B.S. Marietta 1963, M.S. Miami 1965, Ph.D. Rutgers 1968; *associate professor, Microbiology, 1970 (1974)*

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Joseph, Hyman, B.S. Illinois Institute of Technology 1957, M.S. 1959, M.A. Northwestern 1966, Ph.D. 1969; *associate professor, Economics, 1966 (1972)*

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Kammermeyer, Karl, B.S.E. Michigan 1930, B.S. 1930, M.S.E. 1931, D.Sc. 1932; *professor emeritus, Materials Engineering, 1949 (1972)*

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Kelly, Louise B., B.A. Iowa 1945, M.A. 1948; *associate professor, Rhetoric, 1949 (1974)*

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Kennedy, James A, B.S. Wisconsin 1943, M.D. 1945; *clinical assistant professor, Psychiatry, 1969*

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Kerber, Richard E., A.B. Columbia 1960, M.D. New York 1964; *professor, Internal Medicine, 1971 (1978)*

Kerfoot, Karlene M., B.S.N. Iowa 1965, M.A. 1970; *adjunct assistant professor, Nursing, 1970 (1971)*

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Kern, W. R., D.D.S. Iowa 1919, M.S.D. Northwestern 1936; *associate professor emeritus, Fixed Prosthodontics, 1943 (1963)*

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Kerr, Wendle L., B.S. Iowa 1941, M.S. 1950; *associate professor, Pharmacy, 1947 (1961)*

Kessel, Richard G., B.S. Parsons 1953, M.S. Iowa 1956, Ph.D. 1959; *professor, Zoology, 1961 (1968)*

Keyes, Margaret N., B.A. Cornell 1939, M.S. Wisconsin 1951, Ph.D. Florida State 1965; *professor, Home Economics, 1951 (1975)*

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Khowassah, Mohamad A., B.N.S. Alexandria (Egypt) 1953, B.Ch.D. 1957, M.S. Iowa 1964, D.D.S. 1964; *professor, Endodontics, 1964 (1976)*

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Kienzle, George C., D.D.S. Iowa 1958; *adjunct assistant professor, Oral Pathology and Diagnosis, 1966 (1975)*

Killip, Devore E., B.S. Illinois 1944, D.D.S. 1947, M.S. 1963; *professor, Operative Dentistry and Educational Psychology, Measurement and Statistics, 1966 (1972)*

Kilpatrick, Franklin, B.Ch.E. Minnesota 1941, M.P.H. 1943; *associate professor, Preventive Medicine and Environmental Health, 1961 (1970)*

Kim, Chong Lim, B.A. Seoul (Korea) 1960, M.A. Oregon 1965, Ph.D. 1968; *professor, Political Science, 1967 (1976)*

Kim, Jae-On, B.A. Seoul (Korea) 1961, M.S. Southern Illinois 1964, Ph.D. California (Berkeley) 1976; *associate professor, Sociology, 1970 (1976)*

Kim, Nhak H., D.D.S. Baylor 1966; *adjunct instructor, Family Dentistry, 1971 (1972)*

Kimura, Jun, B.T. Kyoto (Japan) 1957, M.D. 1961; *professor, Neurology, 1972 (1977)*

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Kinney, Carolyn K., B.S.N. Iowa 1973, M.A. 1974; *assistant professor, Nursing, 1975*

Kinney, June M., M.A. Iowa 1976; *instructor, Urban and Regional Planning, 1976*

Kinney, William R., Jr., B.S. Oklahoma State 1963, M.S. 1966, Ph.D. Michigan State 1968; *John F. Murray professor, Accounting, 1969 (1973)*

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Kiraly, John, Jr., B.S. Springfield 1954, B.D. Southeastern Baptist Theological Seminary 1960, M.A. Nevada 1966, Ph.D. Minnesota 1970; *associate professor, Special Education, 1970 (1974)*

Kirk, William A., A.B. DePauw 1958, M.A. Missouri 1960, Ph.D. 1962; *professor, Mathematics, 1967 (1970)*

Kisker, C. Thomas, B.A. Johns Hopkins 1958, M.D. Cincinnati 1962; *associate professor, Pediatrics, 1973*

Klapper, Gilbert, B.S. Stanford 1956, M.S. Kansas 1958, Ph.D. Iowa 1962; *professor, Geology, 1968 (1973)*

Klasson, Charles R., B.S. Ohio State 1953, M.B.A. 1956, D.B.A. Indiana 1960; *professor, Business Administration, 1967*

Klaus, Carl H., B.A. Michigan 1953, M.A. 1954, Ph.D. Cornell (Iowa) 1966; *professor, English, 1962 (1973)*

Klee, George G., M.S. Minnesota 1972, M.D. 1973, Ph.D. 1974; *assistant professor, Pathology, 1977*

Klein, Philip W., B.A. Grinnell 1962, M.A. Washington 1974, Ph.D. 1974; *assistant professor, Spanish and Portuguese, 1977*

Klein, Sanford L., B.A. New York 1963, D.D.S. 1967, M.D. Albany State 1971; *assistant professor, Anesthesia and Oral Surgery, 1976*

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Klimstra, Gene A., B.A. Central 1952, M.A. Iowa 1957, M.A. 1968; *adjunct assistant professor, School of Library Science, 1977*

Klingler, George S., B.A. Bucknell 1962, M.T. Illinois 1966, Ph.D. Iowa 1974; *adjunct assistant professor, Speech and Dramatic Art, 1974*

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Klotz, Donald D., B.S. Iowa State Teachers College 1934, M.A. Iowa 1941, Ph.D. 1948; *associate professor emeritus, Physical Education, 1946 (1971)*

Klugman, Stuart A., B.S. Drake 1970, Ph.D. Minnesota 1975; *assistant professor, Statistics, 1974 (1975)*

Knapp, L. W., Jr., B.S. Cornell 1951, M.S. 1955; *professor, Preventive Medicine and Environmental Health, 1959 (1969)*

Knease, Tacie M., B.A. Iowa 1910, M.A. 1911, Ph.D. 1931; *assistant professor emeritus, French and Italian, 1918 (1957)*

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Knott, John R., B.A. Iowa 1935, M.A. 1936, Ph.D. 1938; *professor emeritus, Psychiatry and Neurology, 1941 (1976)*

Knowler, Lloyd A., B.A. Iowa 1932, M.S. 1934, Ph.D. 1937; *professor emeritus, Statistics and Preventive Medicine and Environmental Health, 1939 (1976)*

Knutson, John, A.B. Augustana 1964, M.S. Washington State 1967, Ph.D. 1969; *associate professor, Psychology, 1969 (1974)*

Koch, Richard E., B.A. Yankton 1968, M.A. Michigan State 1971, Ph.D. 1974; *assistant professor, Rhetoric, 1974*

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Kohn, Clyde F., B.A. Northern Michigan 1935, M.A. Michigan 1936, Ph.D. 1940; *professor, Geography, 1958*

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Kolder, Hansjoerg E., M.D. Vienna (Austria) 1950, Ph.D. 1959; *professor, Ophthalmology, 1968 (1973)*

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Koontz, Franklin P., B.S. Maryland 1958, M.S. 1960, Ph.D. 1962; *associate professor, Pathology and Preventive Medicine and Environmental Health, 1964 (1970)*

Korpel, Adrianus, B.S. Delft (Netherlands) 1953, M.S. 1955, Ph.D. 1969; *professor, Information Engineering, 1977*

Korson, Selig M., B.A. Cornell 1932, M.D. Cincinnati 1936; *clinical assistant professor, Psychiatry, 1971*

Kos, Clair M., B.Sc. Nebraska 1933, M.D. 1937; *clinical professor, Otolaryngology and Maxillofacial Surgery, 1970*

Kosler, Frank J., B.S. Michigan State 1956, M.S. 1957, Ph.D. 1960, *professor, Mathematics, 1965 (1970)*

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Kottman, E. John, B.A. Iowa 1949, M.A. 1956, Ph.D. 1963; *associate professor, Business Administration, 1956 (1967)*

Koufer, Jerrold E., D.D.S. Iowa 1963; *adjunct instructor, Family Dentistry, 1974*

Koutsopoulos, K. C., M.S. Colorado 1971, Ph.D. 1975; *assistant professor, Geography, 1975*

Koutsoudas, Andreas, B.A. Michigan 1954, M.A. 1958, Ph.D. 1961; *professor, Linguistics, 1976*

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Krause, Walter., B.A. Oregon 1942, M.A. 1943, A.M. Harvard 1944, Ph.D. 1945; *John F. Murray professor, Economics, 1958*

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Kruckeberg, Dean A., B.A. Wartburg 1969, M.A. Northern Illinois 1974; *instructor, School of Journalism, 1976*

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Kuhl, Ernest P., B.A. Indiana 1907, M.A. Harvard 1908, Ph.D. 1913; *professor emeritus, English, 1926 (1952)*

Kuhlmann, Susan, A.B. Radcliffe/Harvard 1964, M.A. Stanford 1966, Ph.D. New York 1970; *associate professor, English, 1973 (1977)*

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Larson, Carroll B., B.S. Iowa 1931, M.D. 1933; *professor emeritus, Orthopaedic Surgery, 1950 (1977)*

Larson, Erling, M.D. Iowa 1948; *clinical associate professor, Internal Medicine, 1976*

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Laster, Howard J., A.B. Harvard 1951, Ph.D. Cornell 1957; *professor, Physics and Astronomy, 1977*

Lata, Gene F., B.S. City College of New York 1942, M.S. Illinois 1948, Ph.D. 1950; *associate professor, Biochemistry, 1950 (1963)*

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Lee, Un Bong, B.A. Soo-Do Medical (Korea) 1958, M.D. Korea 1962; *clinical assistant professor, Pediatrics, 1975*

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Levey, Samuel, A.B. Bowdoin 1955, A.M. Columbia 1956, M.A. Iowa 1959, Ph.D. 1961, S.M. Harvard 1963; *professor, Hospital and Health Administration, 1977*

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Levy, Donald M, B.S.E.E. Wisconsin 1956, M.S.E.E. Massachusetts Institute of Technology 1958, Ph.D. Wisconsin 1965; *associate professor, Information Engineering, 1965 (1968)*

Lewis, Ervin H., M.A. Iowa 1967; *adjunct instructor, Counselor Education, 1977*

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Lifshitz, Samuel G., B.A. National University of Mexico 1962, M.D. 1968; *assistant professor, Obstetrics and Gynecology, 1976*

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Lilly, David J., B.A. Redlands 1954, M.A. 1957, Ph.D. Pittsburgh 1961; *professor, Speech Pathology and Audiology, 1964 (1973)*

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Lloyd-Jones, Richard, B.A. New Mexico 1949, M.A. North Carolina 1950, Ph.D. Iowa 1956; *professor, English, 1952 (1965)*

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Logan, Nelson S., B.S. Wichita State 1961, M.S. Utah 1965, Ph.D. 1969; *professor, Preventive and Community Dentistry, 1970 (1978)*

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Long, John Paul, B.S. Iowa 1950, M.S. 1952, Ph.D. 1954; *professor, Pharmacology, 1953 (1963)*

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Loomer, Bradley M., B.A. Iowa 1953, M.A. 1956, Ph.D. 1962; *professor, Early Childhood and Elementary Education, 1964 (1970)*

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Lowe, Timothy T., B.A. Iowa 1968, D.D.S. 1974; *adjunct instructor, Family Dentistry, 1977*

Lowry, Michael, B.S. Iowa 1971, M.D. 1974; *assistant professor, Psychiatry, 1977 (1978)*

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Lucier, Charles E., B.A. Wesleyan 1970, M.A. Rochester 1971, Ph.D. 1974; *assistant professor, Political Science, 1974*

Ludke, Robert L., B.A. Wisconsin 1968, M.S. 1971; *instructor, Hospital and Health Administration, 1977*

Luebke, Neil H., D.D.S. Iowa 1969, M.S. 1972; *assistant professor, Operative Dentistry, 1970 (1973)*

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MacIndoe, John H., A.B. Dartmouth 1965, M.D. Jefferson Community 1969; *assistant professor, Internal Medicine, 1976*

MacKenzie, Ian C., L.D.S. Royal College of Surgeons (England) 1962, F.D.S. 1965, Ph.D. London (England) 1970; *professor, Periodontics, 1971 (1976)*

MacNeil, Richard D., B.A. Wisconsin 1970, M.Ed. Springfield 1975; *instructor, Recreation Education, 1975*

MacQueen, John C., A.B. Seattle Pacific 1939, M.D. Kansas 1943; *professor, Pediatrics, 1949 (1958)*

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Madison, Eugene W., B.S. Le Moyne 1956, M.S. Michigan State 1958, Ph.D. Illinois 1966; *associate professor, Mathematics, 1966 (1970)*

Madsen, Donald H., B.S.M.E. Iowa State 1944, M.S.M.E. Purdue 1948, Ph.D. 1953; *professor, Energy Engineering, 1954 (1960)*

Madsen, Douglas K., A.B. Stanford 1961, M.A. California (Los Angeles) 1966, Ph.D. 1969; *associate professor, Political Science, 1971 (1977)*

Malik, Norbert R., B.S. Iowa 1959, M.S.E.E. 1960, Ph.D. Iowa State 1964; *associate professor, Information Engineering, 1967 (1969)*

Marberry, Charles E., B.A. Illinois 1948, M.A. Stanford 1950, Ph.D. Illinois 1952; *professor, Business Administration, 1959 (1964)*

Marcus, Melvin L., B.S. Wisconsin 1962, M.D. 1966; *associate professor, Internal Medicine, 1973 (1976)*

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Markovetz, Allen J., A.B. South Dakota 1957, A.M. 1958, Ph.D. 1961; *professor, Microbiology, 1963 (1973)*

Marme, George W., B.S. Bradley 1946, M.D. Loyola 1948; *clinical assistant professor, Family Practice, 1976*

Marsh, Gordon, B.A. Texas 1926, M.A. 1927, Ph.D. 1930; *professor emeritus, Zoology, 1930 (1970)*

Marshall, Donald G., A.B. Harvard 1965, M.A. Yale 1969, Ph.D. 1971; *associate professor, English, 1975*

Marshall, Keith M., B.A. Grinnell 1965, M.A. Washington 1967, Ph.C. 1969, Ph.D. 1972; *associate professor, Anthropology, 1972 (1976)*

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Martin, Cleo, B.A. State College of Iowa 1946, M.A. University of Northern Iowa 1954; *assistant professor, Rhetoric and English, 1954 (1974)*

Martin, Howard, B.A. Auckland (New Zealand) 1964, M.A. North Carolina 1973, Ph.D. Michigan 1977; *assistant professor, Speech and Dramatic Art, 1975 (1977)*

Martin, Jennifer, B.S. Bowling Green 1967, M.F.A. North Carolina 1969, Ph.D. Michigan 1977; *assistant professor, Speech and Dramatic Art, 1975*

Martin, Murray, B.A. Augustana 1939, M.A. Iowa 1945, Ph.D. 1972; *assistant professor, Secondary Education, 1960 (1972)*

Martin, Paul J., D.D.S. Iowa 1969; *adjunct instructor, Operative Dentistry, 1973*

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Mason, Charles M., B.A. Iowa 1949, M.A. 1951, Ph.D. 1962; *assistant professor, Postsecondary and Continuing Education, 1965*

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Massanari, Robert M., B.A. Goshen 1963, M.D. Northwestern 1967; *assistant professor, Internal Medicine, 1974 (1975)*

Masters, Leonard E., B.S. Florida 1957, M.D. Miami 1961; *associate professor, Family Practice, 1977*

Mather, Betty L., B.Mus. Oberlin 1949, M.A. Columbia 1951; *professor, School of Music, 1952 (1973)*

Mather, George B., B.A. Iowa 1946, M.A. 1954; *associate professor, Division of Continuing Education, 1949 (1959)*

Mather, Roger F., M.A. Massachusetts Institute of Technology 1941; *adjunct professor, School of Music, 1973*

Matheson, Lloyd E., B.S. Wisconsin 1964, Ph.D. 1970; *assistant professor, Pharmacy, 1975*

Matsumoto, Barry D., B.A. Washington 1967, J.D. 1970; *associate professor, Law, 1974*

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Maurer, Ralph, A.B. Harvard 1963, M.D. Yale 1967; *assistant professor, Psychiatry, 1975*

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Maxey, E. James, B.S. Illinois State 1957, M.S. Iowa 1959, Ph.D. 1967; *adjunct associate professor, Educational Psychology, Measurement and Statistics, 1957 (1971)*

Maxwell, Baldwin, B.A., M.A. North Carolina 1915, Ph.D. Chicago 1921, D.Litt. North Carolina 1959; *professor emeritus, English, 1926 (1961)*

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Maxwell, Paul K., D.D.S. Iowa 1953; *adjunct instructor, Removable Prosthodontics, 1968 (1972)*

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Maynard, Jerry A., B.A. University of Northern Iowa 1958, M.S. Indiana 1961, Ph.D. Iowa 1970; *associate professor, Physical Education, Anatomy, and Orthopaedic Surgery, 1972 (1976)*

Mays, A. Louise, B.S. Tuskegee 1940, M.A. Chicago 1957; *assistant professor, School of Social Work, 1972*

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McCormack, William C., B.S. Bowdoin 1948, M.D. Rochester 1952; *clinical assistant professor, Pediatrics, 1977*

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McCue, James F., A.B. Xavier 1955, M.A. Loyola University of Chicago 1958, Ph.D. Wisconsin 1961; *professor, School of Religion, 1965 (1973)*

McCune, Judy K., B.S. Indiana State 1966, M.S. 1968, Ph.D. Iowa 1973; *assistant professor, Physical Education and Dance, 1975*

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McDonald, Donald B., B.S. Utah 1954, M.S. 1956, Ph.D. 1962; *professor, Energy Engineering and Preventive Medicine and Environmental Health, 1962 (1972)*

McDonald, Dorothy T., B.Music Nebraska 1949, M.Ed North Carolina 1963, Ph.D. Ohio State 1970; *associate professor, Early Childhood and Elementary Education 1970 (1975)*

McDonnell, Dennis E., B.S. Rockhurst 1958, M.D. Creighton 1962; *associate professor, Surgery, 1971 (1977)*

McDowell, Frederick P., B.S. Pennsylvania 1937, M.A. 1938, M.A. Harvard 1947, Ph.D. 1949; *professor, English, 1949 (1963)*

McDowell, Margaret B., B.A. Coe 1944, M.A. Iowa 1946, Ph.D. 1954; *professor, Rhetoric, 1967 (1977)*

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McGalliard, John C., B.A. North Carolina 1924, M.A. 1925, M.A. Harvard 1929, Ph.D. 1930; *professor emeritus, English, 1931 (1975)*

McGinnis, William, B.S. Iowa State 1969, M.D. Iowa 1973; *assistant professor, Radiology, 1977*

McGowan, Gerald J., B.A. Carroll 1959, M.D. Iowa 1963; *clinical assistant professor, Family Practice, 1975*

McGuinness, Gail, A.B. Regis 1968, M.D. Tufts 1972; *assistant professor, Pediatrics, 1976 (1977)*

McKay, Kenneth H., M.D. Iowa 1952; *clinical assistant professor, Surgery, 1976*

McKeighen, Rosemary J., B.A. Indiana 1950, B.S.N. California State 1965, M.S. California (Los Angeles) 1967; *associate professor, Nursing, 1975*

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McKusick, Marshall B., B.A. Minnesota 1952, M.A. 1954, Ph.D. Yale 1960; *associate professor, Anthropology, 1960 (1964)*

McLaughlin, John C., B.M. Eastman School of Music 1948, B.A. Kenyon 1950, M.A. Toledo 1952, Ph.D. Indiana 1961; *professor, English and Linguistics, 1958 (1967)*

McLeran, James, B.A., B.S. Simpson 1953, D.D.S. Iowa 1957, M.S. Iowa 1962; *professor, Oral Surgery, 1972*

McLure, John W., B.S. Illinois 1956, M.A. 1961, Ph.D. 1968; *associate professor, Secondary Education, 1969 (1974)*

McNulty, Michael L., B.S. California State (Pennsylvania) 1962, M.A. Northwestern 1964, Ph.D. 1966; *professor, Geography, 1969 (1976)*

Mead, Jerud J., B.S. Wisconsin 1967, M.A. University of Northern Iowa 1970, Ph.D. Iowa 1975; *instructor, Computer Science, 1977*

Mead, Sidney E., A.B. Redlands 1934, A.M. Chicago 1938, Ph.D. 1940; *professor emeritus, School of Religion and History, 1964 (1972)*

Meade, Charles J., B.A. Minnesota 1971, Ph.D. Maryland 1977; *assistant professor, Counselor Education, 1977*

Meder, Joseph B., B.S. Iowa 1971, M.S. 1973; *instructor, Museum of Natural History, 1975*

Meek, Edward S., M.B.Ch.B. St. Andrew's (Scotland) 1951, M.D. 1955; *professor, Pathology and Ophthalmology, 1970*

Megill, Allan D., B.A. Saskatchewan (Canada) 1969, M.A. Toronto (Canada) 1960, Ph.D. Columbia 1975; *assistant Professor, History, 1974*

Mei, Y. P., B.A. Oberlin 1924, Ph.D. Chicago 1927, LL.D. Oberlin 1943, L.H.D. Wabash 1950; *professor emeritus, East Asian Languages and Literature, 1955 (1969)*

Melchert, Thomas E., B.A. Lawrence 1958, M.S. Wisconsin 1960, Ph.D. Texas 1963; *associate professor, Botany, 1963 (1968)*

Menasco, Michael B., B.A. California State 1968, M.B.A. 1972; Ph.D. Oregon 1975; *assistant professor, Business Administration, 1975*

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Mensher, John, B.A. Brown 1963, M.D. State University of New York (Buffalo) 1967, M.S. Iowa 1973; *assistant professor, Ophthalmology, 1972 (1974)*

Menzer, Carl, B.E. Iowa 1921, M.S. 1922, E.E. 1925; *professor emeritus, Information Engineering, 1923 (1968)*

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Merker, Karl K., B.A. Illinois (Jacksonville) 1952; *associate professor, English, 1967 (1974)*

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Mescher, Kay Deegan, B.A. Iowa 1965, M.S. 1975; *assistant professor, Dental Hygiene 1965 (1975)*

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Mielnik, Edward M., B.S.M.E. Iowa 1943, M.S. Massachusetts Institute of Technology 1952; *associate professor, Materials Engineering, 1946 (1959)*

Milde, Frances K., B.S.N. Missouri (Columbia) 1971, M.S.N. Western Reserve 1974; *assistant professor, Nursing, 1974*

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Milkman, Roger D., A.B. Harvard 1951, A.M. 1954; Ph.D. 1956; *professor, Zoology, 1968*

Miller, Charles T., Ph.B. Chicago 1935, Ph.D. 1947; *associate professor emeritus, English, 1947 (1978)*

Miller, Chester I., B.S. Iowa 1925, M.D. 1926; *professor emeritus, Preventive Medicine and Environmental Health, 1928 (1969)*

Miller, Donald M., B.A. San Diego State 1968, M.A. Southern California 1973; *assistant professor, Military Science, 1977*

Miller, Franklin, B.A. Oberlin 1962, M.A. Ohio State 1964, M.F.A. 1970; *associate professor, Speech and Dramatic Art, 1970 (1976)*

Miller, Leonard A., B.A. Morningside 1957, M.A. Iowa 1959, Ph.D. 1963; *professor, Counselor Education, 1962 (1969)*

Miller, Robert D., B.S. Iowa State 1969, M.S. Pittsburgh 1875, J.D. Yale 1974; *adjunct assistant professor, Hospital and Health Administration, 1977*

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Miller, Sheryl L., B.S.N. Iowa 1971, M.A. 1977; *instructor, Nursing, 1974*

Miller, Thaxter H., D.D.S. Minnesota 1940, M.S. Iowa 1954; *associate professor, Removable Prosthodontics, 1962 (1971)*

Mitros, Frank A., B.S. Seton Hall 1965, M.D. New Jersey College of Medicine 1969; *assistant professor, Pathology 1976 (1978)*

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Moeller, Leslie G., B.A. Iowa 1925, D.Litt. Wartburg 1957; *professor emeritus, School of Journalism, 1946 (1973)*

Moessner, Harold F., B.A. Iowa 1951, M.D. 1953; *assistant professor, Family Practice, 1971*

Moffatt, David J., B.Sc. Bristol (England) 1961, M.B.Ch.B. 1964; *associate professor, Anatomy, 1968 (1971)*

Mohler, J. Dawson, A.B. Missouri 1949, A.M. 1950, Ph.D. California (Berkeley) 1955; *professor, Zoology, 1966 (1969)*

Molen, Marilyn T., B.S.N. Augustana 1960, M.A. Iowa 1967, Ph.D. 1976; *associate professor, Nursing, 1963 (1977)*

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Montgomery, John C., B.A. Missouri 1952, D.D.S. Missouri (Kansas City) 1956, M.S. 1959; *professor, Oral Surgery, 1974*

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Moomey, Wayne L., B.A. Drake 1965, M.A. Iowa 1967; *adjunct instructor, Counselor Education, 1970 (1974)*

Mooney, William B., Ph.B. Notre Dame 1941, D.Jur. 1942; *assistant professor, School of Social Work, 1975*

Morgan, Chester A., B.A. Iowa 1936, M.A. 1945, Ph.D. 1951; *professor, Economics, 1952 (1961)*

Morgan, Donald P., B.S. Franklin and Marshall 1944, M.S. Northwestern 1949, M.D. Indiana 1947, Ph.D. Northwestern 1953; *associate professor, Preventive Medicine and Environmental Health, 1973 (1977)*

Moriarty, Mark M., B.S. Purdue 1967, M.A. California (Los Angeles) 1969, Ph.D. Purdue 1973; *associate professor, Business Administration, 1975 (1978)*

Morrell, David, B.A. Waterloo (Canada) 1966, M.A. Pennsylvania State 1967, Ph.D. 1970; *professor, English, 1970 (1977)*

Morris, Adalaide, B.A. Wells 1964, M.A. Minnesota 1966, Ph.D. 1972; *assistant professor, English, 1974*

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Morris, Hughlett, B.A. Iowa 1952, M.A. 1957, Ph.D. 1960; *professor, Otolaryngology and Maxillofacial Surgery and Speech Pathology and Audiology, 1957 (1969)*

Morris, Woodrow W., B.A. Michigan State Normal 1935, M.A. Michigan 1939, Ph.D. 1949; *professor, Medicine, 1948 (1959)*

Morrissey, Leo J., B.S. Loras 1950, Physical Therapy Certificate Iowa 1951, M.A. 1965; *assistant professor, Physical Therapy, 1964 (1969)*

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Mosher, Craig R., B.A. Antioch 1966, M.A. Columbia 1968, Ph.D. Union 1971; *assistant professor, School of Social Work, 1975*

Moss, B. Frank, B.A. Whitworth 1959, M.F.A. Boston 1963; *associate professor, School of Art and Art History, 1976*

Motto, Edwin A., M.D. Loyola 1947; *clinical associate professor, Internal Medicine, 1976*

Moyers, Jack, B.A. Iowa 1943, M.D. 1945; *professor, Anesthesia, 1951 (1966)*

Muehl, Lois B., B.A. Oberlin 1941, M.A. Iowa 1967; *associate professor, Rhetoric, 1965 (1975)*

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Mueller, Charles W., B.S. Iowa State 1965, M.S. 1967, Ph.D. Wisconsin 1973; *associate professor, Sociology, 1972 (1977)*

Muhly, Paul S., B.A. Iowa 1965, M.A. Michigan 1966, Ph.D. 1969; *professor, Mathematics and Statistics, 1969 (1976)*

Muir, Robert M., B.A. Wyoming 1938, M.A. Michigan 1941, Ph.D. 1946; *professor, Botany, 1948 (1961)*

Muir, Thomas G., *associate professor emeritus, School of Music, 1937 (1959)*

Mukhopadhyay, Amar, B.S. Calcutta (India) 1956, M.S. 1959, D. Phil. (Sc.) 1962; *professor, Computer Science, 1969 (1973)*

Mulford, Harold A., B.S. Morningside 1947, M.A. Iowa 1950, Ph.D. 1955; *professor, Psychiatry, 1956 (1966)*

Mullen, Karen A., B.A. Grinnell 1963, M.A. Iowa 1966, Ph.D. 1973; *assistant professor, Linguistics, 1973 (1974)*

Munns, Richard E., B.A. Iowa State Teachers 1939, M.D. Kansas 1950; *assistant professor, Family Practice, 1975*

Munson, Alan K., M.D. Iowa 1967; *clinical assistant professor, Obstetrics and Gynecology, 1976*

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Murray, James N., B.A. Illinois 1947, M.A. Fletcher 1948, Ph.D. Illinois 1953; *professor, Political Science, 1954 (1967)*

Murray, Michael, B.S. Iowa 1964, M.B.A. Oregon 1967, D.B.A. 1970; *associate professor, Business Administration, 1968 (1973)*

Murray, William M., B.S. New Haven Teachers 1956, M.A. Iowa 1958, Ph.D. 1964; *Professor, English, 1958 (1974)*

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Muston, Alan Lee, B.S.P.H. Southwestern Oklahoma State 1970; *clinical instructor, Pharmacy, 1977*

Muston, Ray A., B.S. Indiana 1961, M.B.A. 01963, Ed.D. 1970; *associate professor, Postsecondary and Continuing Education, 1970 (1975)*

Mutel, Robert L., A.B. Cornell 1968, Ph.D. Colorado 1975; *assistant professor, Physics and Astronomy, 1975*

Myers, Martin G., A.B. Princeton 1963, M.D. Johns Hopkins 1967; *associate professor, Pediatrics, 1974 (1977)*

Myers, Virginia A., B.A. George Washington 1949, M.F.A. California College of Arts 1951; *associate professor, School of Art and Art History, 1962 (1971)*

Nagel, Alan F., A.B. Harvard 1963, M.A. Cornell 1965, Ph.D. 1969; *associate professor, English, 1968 (1972)*

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Neff, John S., B.S. Wisconsin 1957, M.S. 1958, Ph.D. 1961; *associate professor, Physics and Astronomy, 1964 (1968)*

Nelson, Douglas R., B.A. Iowa 1958, D.D.S. 1958; *adjunct instructor, Preventive and Community Dentistry, 1976*

Nelson, Edward B., B.S. Western Kentucky State Teachers 1937, M.S. Vanderbilt 1938, Ph.D. Columbia 1949; *professor, Physics and Astronomy, 1949 (1963)*

Nelson, George C., B.A. Oberlin 1964, M.S. Case Institute of Technology 1965, Ph.D. 1968; *associate professor, Mathematics, 1968 (1974)*

Nelson, Herbert L., B.A. Iowa 1943, M.D. 1946; *professor, Psychiatry, 1963 (1973)*

Nelson, John S., B.A. Kentucky 1971, Ph.D. North Carolina 1977; *assistant professor, Political Science, 1975 (1977)*

Nesbitt, John A., B.A. Michigan State 1955, M.A. Columbia 1961, Ed.D. 1968; *professor, Recreation Education, 1972 (1975)*

Neuhauser, Paul M., B.A. Harvard 1955, LL.B. 1958, LL.M. 1963; *professor, Law, 1963 (1969)*

Neumaier, Arthur, M.D. Duke 1935; *adjunct clinical assistant professor, Oral Pathology and Diagnosis and Family Practice, 1973*

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Nibbelink, William H., B.A. Michigan 1961, M.S. Iowa 1965, Ph.D. Ohio State 1971; *associate professor, Early Childhood and Elementary Education 1971 (1973)*

Nicholson, Donald P., B.S. Iowa State 1951, B.S.M. South Dakota 1959, M.D. Iowa 1961; *assistant professor, Pathology, 1963 (1965)*

Nicholson, Dwight R., B.S.Wisconsin 1969, Ph.D. California (Berkeley) 1975; *assistant professor, Physics and Astronomy, 1978*

Nickelsburg, George W., B.A. Valparaiso 1955, B.D. Concordia Seminary 1960, S.T.M. 1962, Th.D. Harvard 1968; *professor, School of Religion, 1969 (1977)*

Nicknish, Thomas R., B.S. Notre Dame 1957, M.D. Georgetown 1961; *clinical assistant professor, Internal Medicine, 1974*

Nielsen, Arnold T., B.A. Dana 1942, M.D. Nebraska 1945; *clinical assistant professor, Family Practice, 1975*

Nielsen, David H., B.S. Maryland 1965, M.A. 1967, Ph.D. Pennsylvania State 1974; *assistant professor, Physical Therapy, 1975*

Nitzke, Everett A., M.D. Iowa 1950; *clinical assistant professor, Pediatrics, 1977*

Nolf, Luther O., B.S. Kansas State 1926, M.S. 1929, Ph.D. Johns Hopkins 1931; *professor emeritus, Zoology, 1931 (1970)*

Norbeck, Edwin, B.A. Reed 1952, Ph.D. Chicago 1956; *professor, Physics and Astronomy, 1960 (1967)*

Norby, Laurence H., B.S. Duke 1966, M.D. Iowa 1970; *assistant professor, Internal Medicine, 1973 (1977)*

Nordquist, Gerald L., B.S.C. Iowa 1953, M.A. 1956, Ph.D. 1960; *professor, Economics, 1958 (1968)*

North, George, D.D.S. Iowa 1960; *adjunct associate professor, Preventive and Community Dentistry, 1969*

Norton, Dee W., B.S. Illinois State 1947, M.S. Iowa 1950, Ph.D. 1952; *associate professor, Psychology and Statistics, 1957 (1962)*

Norwood, George J., B.S. Medical College of Virginia 1962, Ph.D. Mississippi 1970; *professor, Pharmacy, 1969 (1977)*

Nothnagle, John, B.A. Rochester 1949, Diplôme Toulouse (France) 1950, M.A. Wisconsin 1954, Ph.D. 1959; *professor, French and Italian, 1959 (1973)*

Novick, Melvin R., B.A. Roosevelt 1957, B.S. 1959, M.A. 1959, Ph.D. North Carolina 1963; *professor, Educational Psychology, Measurement and Statistics, and Statistics, 1970*

Nowak, Arthur J., D.D.S. Pittsburgh 1961, M.A. Columbia 1967, D.M.D. 1971; *professor, Pedodontics, 1973 (1977)*

Noyes, Russel, Jr., A.B. DePauw 1956, M.D. Indiana 1959; *professor, Psychiatry, 1965 (1978)*

Nybakken, Oscar E., B.A. Luther 1928, M.A. Iowa 1930, Ph.D. 1937; *professor emeritus, Classics, 1931 (1971)*

Oake, John A., B.S. Colby 1964, M.S. Tulane 1968, Ph.D. 1970; *assistant professor, Anatomy, 1973*

Oberg, Edwin N., B.A. Minnesota 1929, M.A. 1932, Ph.D. 1935; *professor emeritus, Mathematics, 1937 (1952)*

Oberley, Larry W., B.A. Northwestern 1968, M.S. Iowa 1970, Ph.D. 1974; *assistant professor, Radiology, 1975 (1978)*

Obermann, C. Esco, B.A. Iowa 1927, M.A. 1930, Ph.D. 1938; *associate professor emeritus, Counselor Education, 1938 (1970)*

Obrecht, Eldon, B.A. Iowa 1940, M.A. 1942, Ph.D. 1950; *professor, School of Music, 1947 (1967)*

Ochs, Donovan J., B.A. Loras 1960, M.A. Iowa 1963, Ph.D. 1966; *professor, Rhetoric and Speech and Dramatic Art, 1967 (1975)*

O'Connor, James F., B.Agr.Sc. National University of Ireland 1962, M.S. Pennsylvania State 1965, Ph.D. Minnesota 1974; *assistant professor, Economics, 1975*

Odgaard, Anders J., M.S. Technical University of Denmark 1966, Ph.D. 1970; *adjunct assistant professor, Energy Engineering, 1977*

O'Donnel, Alejandro M., M.D. Buenos Aires (Argentina) 1960; *clinical associate professor, Pediatrics 1977*

Oehmke, Robert H., B.S. Michigan 1948, M.S. Detroit 1950, Ph.D. Chicago 1954; *professor, Mathematics, 1964*

Ogesen, Robert B., D.D.S. Iowa 1958; *adjunct assistant professor, Periodontics, 1966 (1974)*

Oglesby, William B., B.S. Miami 1954, M.S. Indiana 1959, Ph.D. 1967; *associate professor, Instructional Design and Technology, 1969*

Ogorman, Richard, B.A. Washington (Missouri) 1955, M.A. 1957, Ph.D. Pennsylvania 1962; *professor, French and Italian, 1967*

Ohmes, Allen F., B.M. Baldwin Wallace 1953, M.M. Rochester 1959; *professor, School of Music, 1964 (1970)*

Ohrn, Karin B., B.A. Wellesley 1968, M.A. Indiana 1972, Ph.D. 1975; *assistant professor, School of Journalism, 1975*

Olds, John W., B.S. Iowa State 1956, M.D. Tennessee 1967; *clinical assistant professor, Internal Medicine, 1977*

Oliker, Vladimir I., M.S. Leningrad (U.S.S.R.) 1967, Ph.D. 1971; *associate professor, Mathematics, 1977*

Olin, William H., D.D.S. Marquette 1947, M.S. Iowa 1948; *professor, Otolaryngology and Maxillofacial Surgery and Orthodontics, 1948 (1963)*

Olmstead, Karen L., M.S.W. Iowa 1966; *adjunct instructor, School of Social Work, 1976*

Olson, Paul R., B.S.C. Iowa 1922, M.A. 1928, Ph.D. 1931; *professor emeritus, Economics, 1929 (1967)*

O'Mara, John J., B.S. Rose Polytechnic Institute 1930, M.S. Purdue 1946; *associate professor emeritus, Systems Engineering, 1946 (1975)*

Orgren, Carl F., Ph.B. Detroit 1959, A.M.L.S. Michigan 1962, M.A. Detroit 1966, Ph.D. Michigan 1971; *associate professor, School of Library Science, 1970 (1976)*

Osbon, Donald B., B.S. Pittsburgh 1952, D.D.S. 1954; *professor, Oral Surgery, 1973*

Osborn, Margaret O., B.S. Nebraska 1929, M.S. 1931, Ph.D. Iowa 1951; *professor emerita, Home Economics and Periodontics, 1951 (1975)*

Osborn, Velva J., B.S. Kansas State 1939, M.A. Chicago 1944, M.A. Illinois 1962, Ph.D. 1965; *professor, School of Library Science, 1971*

Osborne, James W., B.S. Illinois 1949, M.S. 1951, Ph.D. 1955; *professor, Radiation Research Laboratory, 1955 (1967)*

Osburn, James O., B.S. Michigan 1939, M.S. 1940, Ph.D. 1944; *professor, Materials Engineering, 1946 (1957)*

Ossolnig, Karl C., M.D. Vienna (Austria) 1960; *professor, Ophthalmology, 1971 (1977)*

Oster, Harry, A.B. Harvard 1946, M.B.A. Columbia 1948, M.A. Cornell 1950, Ph.D. 1953; *professor, English, 1963 (1968)*

Ostmoe, Patricia M., B.S. St. Catherine 1962, M.S. California (San Francisco) 1964; *assistant professor, Nursing, 1964 (1967)*

Otis, Richard E., M.D. Iowa 1967; *clinical assistant professor, Anesthesia, 1977*

Overland, Anna E., B.S. Iowa 1934, M.A. Columbia 1949; *associate professor emerita, Nursing, 1952 (1976)*

Owen, Whyte G., B.S. Louisiana State 1964, M.S. 1967, Ph.D. North Carolina 1972; *assistant professor, Pathology and Biochemistry, 1974*

Pace, Roger A., B.A. Valdosta 1969, M.S. Southern Illinois 1975; *assistant professor, Aerospace Military Studies, 1978*

Pachow, Wang, B.A. Shanghai (China) 1936, Ph.D. Bombay (India) 1948; *professor, School of Religion, 1968 (1975)*

Paff, William J., B.A. Wisconsin 1928, M.A. Harvard 1931, Ph.D. 1950; *professor emeritus, English, 1950 (1975)*

Palmer, Charles M., B.A. Grinnell 1961, M.A. Chicago 1964; *adjunct assistant professor, School of Social Work, 1975*

Palumbo, Louis T., B.S. Loyola 1931, M.S. 1932, M.D. 1934; *clinical professor emeritus, Surgery, 1956 (1977)*

Pampel, Fred C., B.A. Illinois 1973, M.A. 1974, Ph.D. 1977; *assistant professor, Sociology, 1977*

Panglilinan, Nestor S., A.A. University of the East (Philippines) 1959, M.D. 1964; *clinical instructor, Psychiatry, 1975*

Panje, William R., B.S. Iowa Wesleyan 1965, M.S. Iowa 1967, M.D. 1971, M.S. 1977; *assistant professor, Otolaryngology and Maxillofacial Surgery, 1976 (1977)*

Parcel, Toby L., B.A. North Carolina 1971, M.A. Washington 1972, Ph.D. 1977; *assistant professor, Sociology, 1977*

Parker, Loran F., B.A. Iowa 1944, M.D. 1945; *associate professor, Family Practice, 1971 (1976)*

Parkes, Ford B., B.A. Kent State 1964, M.A. 1966, Ph.D. Michigan State 1971; *associate professor, German, 1969 (1976)*

Parkins, Frederick M., D.D.S. Pennsylvania 1960, M.S.D. North Carolina 1967, Ph.D. 1969; *professor, Pedodontics, 1969 (1972)*

Parks, Alfrieta V., A.B. George Washington 1969, M.A. Princeton 1971; *instructor, Afro-American Studies and Anthropology, 1976*

Parrott, Eugene L., B.S. Wisconsin 1949, Ph.D. 1954; *professor, Pharmacy, 1962 (1974)*

Parrott, Ray J., B.A. Cornell 1963, M.A. Michigan 1967, Ph.D. 1974; *associate professor, Russian, 1971 (1977)*

Parry, Ellwood C., B.A. Harvard 1964, M.A. California (Los Angeles) 1966, Ph.D. Yale 1970; *associate professor, School of Art and Art History, 1976*

Parsons, Mabel H., B.A. Iowa 1933, M.S. 1958; *assistant professor, Home Economics, 1960 (1963)*

Parton, David A., A.B. Willamette 1953, Ph.D. Duke 1963; *professor, Sociology, 1965 (1976)*

Patel, Virendra C., A.C.G.I. London (England) 1962, B.Sc. 1962, Ph.D. Cambridge (England) 1965; *professor, Energy Engineering, 1971 (1975)*

Paterson, George W., B.A. Simpson 1952, B.D. Drew Theological Seminary 1955, Ph.D. Iowa 1969; *associate professor, School of Religion and Internal Medicine, 1970 (1975)*

Patil, Shivanand R., B.S. Karnatak (India) 1961, M.S. 1963, Ph.D. Colorado 1969; *assistant professor, Pediatrics, 1977*

Patrick, Joseph A., B.F.A. Georgia 1960, M.F.A. Colorado 1962; *associate Professor, School of Art and Art History, 1965 (1971)*

Patterson, Samuel C., B.A. South Dakota 1953, M.S. Wisconsin 1956, Ph.D. 1959; *professor, Political Science, 1961 (1967)*

Paul, David M., M.D. Middlesex County 1937; *clinical associate professor, Orthopaedic Surgery, 1956 (1964)*

Paul, Sherman, B.A. Iowa 1941, M.A. Harvard 1948, Ph.D. 1950; *Carver professor, English, 1946 (1967)*

Paulson, Wayne L., B.S. Wisconsin 1959, M.S. 1960, Ph.D. Iowa 1965; *professor, Energy Engineering, 1960 (1972)*

Payne, Gerald L., B.S. Ohio State 1961, M.S. 1961, Ph.D. California (San Diego) 1967; *associate professor, Physics and Astronomy, 1969 (1974)*

Peck, George S., B.B.A. Chattanooga 1935, M.A. Virginia 1939, Ph.D. Indiana 1952; *professor emeritus, Economics, 1952 (1976)*

Pedrini, Vittorio A., D.Phar. Pavia (Italy) 1955; *professor, Orthopaedic Surgery and Biochemistry, 1958 (1974)*

Pegnetter, Richard C., B.A. Indiana University of Pennsylvania 1966, M.Ed. 1966, Ph.D. Cornell 1971; *associate professor, Business Administration, 1971 (1978)*

Pelenski, Jaroslaw, Ph.D. Munich (Germany) 1957, Certificate Columbia 1964, Ph.D. 1968; *professor, History, 1967 (1971)*

Penick, George D., B.S. North Carolina 1944, M.D. Harvard 1946; *professor, Pathology, 1970*

Penick, John, B.S. Miami 1966, M.A. 1969, Ph.D. Florida State 1973; *associate professor, Secondary Education, 1975 (1977)*

Penningroth, R. Paul, B.A. Iowa 1960, M.D. 1964; *clinical assistant professor, Psychiatry, 1965 (1970)*

Pepper, Robert, B.A. Wisconsin 1970, Ed.M. Temple 1971, Ph.D. Wisconsin 1975; *assistant professor, Speech and Dramatic Art, 1974 (1975)*

Perret, George E., M.D. Berlin (Germany) 1938, S.M. Northwestern 1944, Ph.D. 1948; *professor emeritus, Surgery, 1949 (1978)*

Perry, Paul J., B.S. University of the Pacific 1969, M.S. 1971, Ph.D. 1973; *associate professor, Pharmacy, 1973 (1978)*

Persons, Stow, B.A. Yale 1936, Ph.D. 1940; *professor, History, 1950*

Pesanti, Edward L., B.A. Carroll (Montana) 1965, M.D. Chicago 1969; *assistant professor, Internal Medicine, 1975*

Petersen, William J., B.A. Dubuque 1926, M.A. Iowa 1927, Ph.D. 1930; *associate professor emeritus, History, 1930 (1969)*

Peterson, Frank R., B.S. Iowa 1918, M.D. 1920; *professor emeritus, Surgery, 1920 (1972)*

Peterson, Lawrence C., B.S.M.E. General Motors Institute 1962, M.S. Iowa 1970; *assistant professor, Family Dentistry, 1973 (1978)*

Peterson, Richard E., B.S. Washington 1942, B.M.S. Northwestern 1945, M.D. 1946; *professor, Radiology and Internal Medicine, 1954 (1966)*

Peterson, Ronald J., D.D.S. Nebraska 1974, M.S. 1976; *assistant professor, Family Dentistry and Periodontics, 1977*

Pflaum, Ronald T., B.A. St. Olaf 1948, M.S. Purdue 1951, Ph.D. 1953; *professor, Chemistry, 1953 (1963)*

Phair, W. Philip, D.D.S. Iowa 1945, M.P.H. Michigan 1948, B.A. Ricker 1951; *professor, Preventive and Community Dentistry, 1968*

Phelps, Charles D., B.A. Iowa 1959, M.D. 1963; *associate professor, Ophthalmology, 1972 (1976)*

Phillips, Darrell G., B.M. Sul Ross State 1952, M.A. Texas 1960, Ph.D. Florida State 1967; *associate professor, Early Childhood and Elementary Education 1968 (1971)*

Phillips, Michael I., B.Sc. Exeter (England) 1962, M.Sc. Birmingham (England) 1965, Ph.D. 1967; *professor, Physiology and Biophysics, 1970 (1977)*

Phillips, Susan M., B.A. Georgia 1967, M.S. Louisiana 1971, Ph.D. Louisiana State 1973; *associate professor, Business Administration, 1974 (1978)*

Piersol, Frank A., B.A. Grinnell 1933, M.A. Iowa 1943; *professor, School of Music, 1967*

Pietrzyk, Donald J., B.S. Wayne State 1956, Ph.D. Iowa State 1960; *professor, Chemistry, 1961 (1971)*

Pingel, Kurt R., B.S. Wisconsin 1969, M.A. Pittsburgh 1975, Ph.D. 1977; *assistant professor, Educational Psychology, Measurement and Statistics, 1976*

Pinkham, Jimmy R., B.S. North Carolina 1967, D.D.S. 1970; *associate professor, Pedodontics, 1972 (1976)*

Piros, James, B.S. Illinois 1967, M.D. 1971; *clinical assistant professor, Internal Medicine, 1977*

Pitkin, Roy M., B.A. Iowa 1956, B.S. Iowa State 1956, M.D. Iowa 1959; *professor, Obstetrics and Gynecology, 1968 (1972)*

Pizzini, Edward L., B.S. Montana State 1963, M.S. Houston 1968, Ph.D. Iowa 1973; *associate professor, Secondary Education, 1973 (1978)*

Plapp, Bryce V., B.S. Michigan State 1961, Ph.D. California (Berkeley) 1966; *associate professor, Biochemistry, 1970 (1974)*

Platz, Charles E., B.A. Kansas 1959, M.D. Chicago 1963; *associate professor, Pathology, 1975*

Pletsch, Pamela K., B.S.N. Iowa 1972, M.S. Colorado 1976; *instructor, Nursing, 1976*

Pogue, Thomas F., B.S. New Mexico State 1957, M.S. Oklahoma State 1962, M.A. Yale 1963, Ph.D. 1968; *professor, Economics, 1965 (1974)*

Policano, Andrew J., B.S. State University of New York (Stony Brook) 1971, M.A. Brown 1973, Ph.D. 1975; *assistant professor, Economics, 1975*

Polich, John J., M.D. Iowa 1950; *clinical assistant professor, Pediatrics, 1977*

Pollock, Sheldon I., A.B. Harvard 1971, A.M. 1973, Ph.D. 1975; *assistant professor, School of Religion and East Asian Languages and Literature, 1975*

Ponseti, Ignacio V., B.S. Barcelona (Spain) 1932, M.D. 1936; *professor, Orthopaedic Surgery, 1945 (1957)*

Pope, Hallowell, B.A. Chicago 1951, M.A. 1957, Ph.D. Michigan 1963; *associate professor, Sociology, 1968*

Porter, J. R., B.S. Iowa State 1933, M.S. 1935, Ph.D. Yale 1938; *professor emeritus, Microbiology, 1938 (1977)*

Porter, Samuel D., A.B. Grinnell 1956, M.D. Creighton 1960; *clinical assistant professor, Surgery, 1974*

Posner, Edward, Jr., B.S. Notre Dame 1941, M.D. Loyola 1943; *clinical assistant professor, Internal Medicine, 1963*

Post, Edward L., B.A. Colorado 1966, M.D. 1970; *assistant professor, Anesthesia, 1976*

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Powell, Marcus P., B.S. Iowa State 1934, M.S. Iowa 1941, B.S.C.E. 1942; *associate professor emeritus, Preventive Medicine and Environmental Health and Energy Engineering, 1943 (1976)*

Powell, Sandra R., B.A. Coe 1963, M.Ed. Columbia (Teachers College) 1969; *assistant professor, Nursing, 1969 (1974)*

Pownall, Fred M., B.A. Iowa 1911, M.A. 1913, *associate professor emeritus, School of Journalism, 1939 (1955)*

Preucil, William W., B.M. Eastman 1952, M.M. Rochester 1956; *professor, School of Music, 1958 (1971)*

Price, James L., B.S. Ohio State 1950, M.A. Illinois 1954, Ph.D. Columbia 1962; *professor, Sociology, 1966 (1969)*

Price, Marjorie A., B.S.N. Iowa 1955, M.A. 1964; *assistant professor, Nursing, 1968 (1970)*

Prince, Randall A., B.S. Philadelphia College of Pharmacy and Science 1971, Pharm.D. 1972; *associate professor, Pharmacy, 1975 (1978)*

Printen, Kenneth J., B.S. Loyola University of Chicago 1957, A.M. 1961, M.D. Stritch School of Medicine 1961; *professor, Surgery, 1969 (1976)*

Pulaski, Charles A., B.A. Yale 1964, LL.B. 1967; *professor, Law, 1972 (1975)*

Purdy, Aletha J., B.A. Drake 1950, M.A. 1951, M.S.W. Iowa 1961; *adjunct instructor, School of Social Work, 1978*

Pusack, James P., B.A. Johns Hopkins 1966, M.A. 1967, Ph.D. Indiana 1977; *assistant professor, German, 1974 (1976)*

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Rakel, Robert E., B.S. Cincinnati 1954, M.D. 1958; *professor, Family Practice, 1971*

Ramaprian, Belakavadi, B.E. Mysore (India) 1959, M.E. Calcutta (India) 1961, Ph.D. Waterloo (Canada) 1969; *adjunct associate professor, Energy Engineering, 1976 (1978)*

Ramberg, John S., B.E.E. Minnesota 1961, M.S. Cornell 1966, Ph.D. 1969; *professor, Systems Engineering and Statistics, 1967 (1977)*

Randall, David J., D.D.S. Iowa 1967; *clinical assistant professor, Dental Support Services, 1976*

Randall, Walter L, B.A. Louisville 1957, Ph.D. Chicago 1961; *professor, Psychology, 1965 (1975)*

Randles, Ronald H., B.A. Wooster 1964, M.S. Florida State 1966, Ph.D. 1969; *Professor, Statistics, 1969 (1978)*

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Ray, Robert F., B.A. Coe 1944, M.A. Iowa 1945, Ph.D. 1947; *professor, Division of Continuing Education, 1949 (1954)*

Read, Charles H., B.Sc. Acadia (Nova Scotia) 1939, M.D. McGill (Canada) 1943; *professor, Pediatrics, 1954 (1959)*

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Reese, Jean L., B.S.N. Nebraska 1961, M.N. Washington 1968; *assistant professor, Nursing, 1969 (1971)*

Reger, Scott N., B.A. West Virginia 1927, M.A. Iowa 1930, Ph.D. 1933; *professor emeritus, Otolaryngology and Maxillofacial Surgery, 1933 (1969)*

Regne-Karlsson, M.H., B.S. Karolinska Institutet (Sweden) 1958, M.D. 1967; *clinical assistant professor, Pediatrics, 1975*

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Reimer, Toni Tripp, B.S.N. Maryland 1969, M.S.N. Ohio State 1973, M.A. 1974, Ph.D.1977; *assistant professor, Nursing, 1977*

Reinhardt, John W., B.A. Illinois Wesleyan 1971, D.D.S. Loyola 1975; *clinical instructor, Operative Dentistry, 1977*

Reiss, Robert, Sc.B. Brown 1963, Ph.D. Illinois Institute of Technology 1967; *assistant professor, Materials Engineering, 1973*

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Reynolds, David G., B.A. Knox 1955, M.S. Illinois 1957, Ph.D. Iowa 1963; *associate professor, Surgery and Physiology and Biophysics, 1977*

Reynolds, David R., B.S. Pennsylvania State 1962, M.S. Northwestern 1963, Ph.D. 1967; *professor, Geography, 1968 (1974)*

Richards, Carl J., B.A. Iowa 1960, M.D. 1964; *assistant professor, Internal Medicine, 1973 (1974)*

Richardson, Robert L., D.M.D. Louisville 1944, M.S. Iowa 1953; *associate professor, Microbiology, 1951 (1963)*

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Richman, Lynn C., B.A. Grinnell 1967, M.A. Iowa 1970, Ph.D. 1973; *assistant professor, Pediatrics, 1973*

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Riesz, Peter C., B.S. Rutgers 1958, M.B.A. Columbia 1963, Ph.D. 1971; *associate professor, Business Administration, 1968 (1973)*

Riezman, Raymond G., B.A. Washington (Missouri) 1969, Ph.D. Minnesota 1977; *assistant professor, Economics, 1976 , (1977)*

Righter, Charles B., B.Mus. Nebraska 1917, B.F.A. 1926; *associate professor emeritus, School of Music, 1930 (1964)*

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Riley, Walter J., B.S. Fort Valley State 1960, M.D. Meharry Medical 1964; *clinical assistant professor, Surgery, 1971 (1974)*

Rim, Kwan, B.S.M.E. Tri-State 1955, M.S.M.E. Northwestern 1958, Ph.D. 1960; *professor, Materials Engineering, 1960 (1968)*

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Robertson, H. Douglas, D.D.S. Iowa 1975; *adjunct instructor, Fixed Prosthodontics, 1978*

Robertson, Maureen, B.A. Indiana 1958, M.A. 1960, Ph.D. Washington 1970; *associate professor, East Asian Languages and Literature and Comparative Literature, 1976*

Robertson, Rachel, M.A. Oregon 1976; *adjunct instructor, Recreation Education, 1977*

Robertson, Timothy J., B.A. Missouri 1959, M.A. 1961, Ph.D. 1966; *professor, Statistics, 1965 (1974)*

Robillard, Jean, B.A. Montreal (Canada) 1964, M.D. 1968; *associate professor, Pediatrics, 1974 (1978)*

Robinson, John P., B.S. Iowa 1960, M.A. Princeton 1962, Ph.D. 1966; *professor, Information Engineering, 1965 (1972)*

Rock, Mary E., B.S. Washington (Missouri) 1949, M.A. Iowa 1960; *assistant professor emeritus, Nursing, 1956 (1971)*

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Rogers, Ruth H., B.S.N. Columbia 1953, M.S. Minnesota 1965; *assistant professor, Nursing, 1974*

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Rorex, Robert A., B.A. Hendrix 1956, M.F.A. Princeton 1968, Ph.D. 1975; *assistant professor, School of Art and Art History, 1970 (1975)*

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Rose, John G., B.S.P.H. Iowa 1969; *clinical instructor, Pharmacy, 1975*

Roseberry, William C., B.A. Southern Methodist 1971, M.A. Connecticut 1974, Ph.D. 1977; *assistant professor, Anthropology, 1977*

Roseman, Dennis M., B.S. Wisconsin 1961, M.S. 1962, Ph.D. Michigan 1968; *associate professor, Mathematics, 1970 (1976)*

Rosenbaum, Milton E., B.S.S. City College of New York 1948, M.S. 1949, Ph.D. Texas 1954; *professor, Psychology, 1957 (1966)*

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Rosenberger, Thomas G., A.B. Ohio 1966, M.D. Cincinnati 1970; *clinical assistant professor, Pediatrics, 1975*

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Ross, Denise A., B.S. Boston (Chestnut Hill) 1966, M.Ed. 1973, M.A. Iowa 1975; *assistant professor, Nursing, 1975 (1978)*

Ross, Russell M., B.S. Iowa 1942, M.A. 1946, Ph.D. 1948; *professor, Political Science, 1948 (1965)*

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Rossmann, Patricia P., B.S. Iowa 1970, M.S. 1973; *assistant professor, Dental Hygiene, 1973*

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Rowley, Vinton N., B.A. Central 1950, M.A. Iowa 1954, Ph.D. 1958; *professor, Pediatrics, 1957 (1968)*

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Rubright, William C., A.B. Westminster (Missouri) 1957, D.D.S. Missouri 1962, M.S. 1963; *associate professor, Periodontics, 1967 (1972)*

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Rushton, Gerard, B.A. Wales (United Kingdom) 1959, M.A. 1962, Ph.D. Iowa 1964; *professor, Geography, 1969 (1974)*

Ruther, Lavonne M., B.S.N. Iowa 1965, M.A. 1969; *assistant professor, Nursing, 1969 (1971)*

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Ryan, Michael D., B.A. Conception Seminary 1956, M.S.W. St. Louis 1965; *adjunct instructor, School of Social Work, 1978*

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Saboe, Beverly J., B.S.N. Iowa 1965, M.N. Washington 1971; *assistant professor, Nursing, 1968 (1973)*

Sagen, H. Bradley, B.A. Grinnell 1957, Ph.D. Minnesota 1962; *professor, Postsecondary and Continuing Education, 1964 (1973)*

Sahs, Adolph L., M.D. Iowa 1931; *professor emeritus, Neurology, 1936 (1974)*

Salamon, Gerald L., B.S. Illinois 1964, M.S. Roosevelt 1966, Ph.D. Ohio State 1971; *associate professor, Accounting, 1974 (1975)*

Salisbury, Neil E., B.A. Minnesota 1950, Ph.D. 1957; *professor, Geography, 1955 (1975)*

Samuelson, David L., D.D.S. Iowa 1972; *adjunct instructor, Family Dentistry, 1974*

Sando, Kenneth M., B.Chem. Minnesota 1961, Ph.D. Wisconsin 1968; *associate professor, Chemistry, 1969 (1974)*

Sandrock, James P., B.A. Iowa 1951, M.A. 1958, Ph.D. 1961; *professor, German, 1960 (1977)*

Santala, Roger G., B.S. Northwestern 1968, M.D. 1970; *assistant professor, Internal Medicine, 1977*

Santizo, Mario J., B.S. St. Louis 1964, M.A. 1966, Ph.D. 1975; *assistant professor, Spanish and Portuguese, 1970 (1974)*

Sass, Stephen L., Dr.Pol. Budapest (Hungary) 1939, J.D. 1943, M.S.L.S. Western Reserve 1961; *professor, Law, 1964 (1977)*

Sato, Kenzo, M.D. Hakkaido (Japan) 1964, Ph.D. Tohoku (Japan) 1977; *assistant professor, Dermatology, 1978*

Savage, Helen, B.S. Iowa State 1951, M.S. Iowa 1968; *instructor, Home Economics, 1968 (1973)*

Savage, William R., B.S. Iowa State 1951, Ph.D. 1956; *professor, Physics and Astronomy, 1963 (1977)*

Sayre, Robert F., B.A. Wesleyan 1955, M.A. Yale 1958, Ph.D. 1962; *professor, English, 1965 (1972)*

Sayre, William W., B.S.E. Princeton 1949, M.S. Colorado State 1957, Ph.D. 1967; *professor, Energy Engineering, 1968 (1971)*

Saywell, Robert M., Jr., B.S. Rhode Island 1968, M.A. 1969, Ph.D. Colorado State 1972, M.P.H. Johns Hopkins 1973; *assistant professor, Hospital and Health Administration, 1977*

Scahill, Jeannette L., B.S. Central Methodist 1950, M.A. Wyoming 1955, Ph.D. Iowa 1963; *associate professor, Physical Education and Dance and Secondary Education, 1965 (1970)*

Scandrett, Forrest R., D.D.S. Iowa 1965, M.S. Texas 1970; *associate professor, Removable Prosthodontics, 1970 (1974)*

Schaal, David, B.A. Geneva 1942, M.A. Western Reserve 1946, Ph.D. Illinois 1956; *professor, Speech and Dramatic Art, 1956 (1969)*

Schabilion, Jeffry T., B.S. Iowa State 1965, M.A. Kansas 1967, Ph.D. 1969; *associate professor, Botany, 1968 (1973)*

Schaefer, Hadley P., B.S. Michigan 1955, M.B.A. 1956, Ph.D. 1963; *professor, Accounting, 1976*

Schantz, Mark E., B.A. Iowa 1963, B.A. Oxford (England) 1965, LL.B. Yale 1968; *professor, Law, 1969 (1975)*

Schapiro, Rolf L., B.A. Adelbert 1959, M.D. Western Reserve 1964; *professor, Radiology, 1969 (1976)*

Scharlemann, Robert P., B.A. Concordia 1952, B.D. 1955, Th.D. Heidelberg (Germany) 1957; *professor, School of Religion, 1966 (1968)*

Schedl, Harold P., B.S. Yale 1942, M.S. 1944, Ph.D. 1946, M.D. Iowa 1955; *professor, Internal Medicine, 1959 (1967)*

Schedl, Naomi M., B.F.A. Yale 1943, M.F.A. 1944; *associate professor, Home Economics, 1966 (1976)*

Scheffel, Annette L., B.S.N. Indiana 1964, M.S.N.E. 1965; *assistant professor, Nursing, 1965 (1968)*

Scheidrup, Eugene W., M.D. Iowa 1929; *professor emeritus, Anatomy, 1932 (1969)*

Schepanski, Albert A., B.A. Saskatchewan (Canada) 1961, M.A. 1966; *instructor, Accounting, 1978*

Schieken, Richard M., B.A. LaSalle 1961, M.D. Pennsylvania 1965; *associate professor, Pediatrics, 1973 (1976)*

Schiemann, William A., B.S. Illinois Institute of Technology 1971, M.B.A. 1973, Ph.D. Illinois 1976; *assistant professor, Business Administration, 1976*

Schlaser, Verne L., B.S. Iowa 1938, M.D. 1938; *clinical assistant professor, Family Practice, 1974*

Schmid, Phillip, B.A. Carleton 1957, M.D. Chicago 1961; *professor, Internal Medicine, 1968 (1975)*

Schmidt, Anthony J., B.F.A. Kansas City Art Institute 1974, M.F.A. California (Davis) 1976; *instructor, School of Art and Art History, 1976*

Schmidt, Julius, B.F.A. Cranbrook Academy of Art 1953, M.F.A. 1955; *professor, School of Art and Art History, 1970 (1972)*

Schmidt, Marlin R., B.A. Grinnell 1957, Ph.D. Iowa 1968; *associate professor, Counselor Education, 1972 (1978)*

Schmidt, Steven D., M.S. Iowa 1976; *instructor, Urban and Regional Planning, 1976*

Schmit, Robert E., M.S.W. Denver 1966; *adjunct instructor, School of Social Work, 1976*

Schmitt, Donald D., B.A. Iowa 1951, M.D. 1954; *clinical assistant professor, Family Practice, 1974*

Schneider, Erwin H., B.S. Northwest Missouri State 1942, M.S. Kansas 1942, Ph.D. 1956; *professor, School of Music and Secondary Education, 1969*

Schnetzler, Douglas E., B.S. Iowa State 1965, M.D. Iowa 1968; *clinical assistant professor, Pathology, 1972*

Schnoor, Jerald L., B.S. Iowa State 1972, M.S. Texas 1974, Ph.D. 1975; *assistant professor, Energy Engineering, 1977*

Schoderbek, Peter, B.A. Pennsylvania State 1954, M.S. 1959, Ph.D. Michigan 1964; *professor, Business Administration, 1964 (1971)*

Schoen, Harold L., B.S. Dayton 1963, M.S. Indiana 1966, M.S. Dayton 1969, Ph.D. Ohio State 1971; *professor, Secondary Education and Mathematics, 1974 (1978)*

Schoenbaum, David L., B.A. Wisconsin 1955, M.A. Wisconsin 1958, D.Phil. Oxford (England) 1965; *professor, History, 1967 (1971)*

Schoer, Lowell A., B.A. Iowa 1958, M.A. 1959, Ph.D. 1961; *professor, Instructional Design and Technology, 1961 (1967)*

Scholz, Paul D., B.S.M.E. Washington 1960, M.S.M.E. Northwestern 1965, Ph.D. 1967; *associate professor, Energy Engineering, 1967 (1970)*

Schottelius, Byron, B.A. Iowa 1949, M.A. State College of Washington 1951, Ph.D. Iowa 1954; *professor, Physiology and Biophysics, 1957 (1967)*

Schottelius, Dorothy, B.A. Iowa 1949, M.S. Washington State 1951, Ph.D. North Carolina 1957; *assistant professor, Neurology, 1975*

Schreier, John F., D.D.S. Iowa 1973; *adjunct instructor, Family Dentistry, 1974*

Schrimper, George D., B.S. Iowa 1964, M.A. 1965; *assistant professor, Museum of Natural History, 1966 (1973)*

Schrock, Christian E., B.A. Iowa 1941, M.D. 1944; *clinical associate professor, Internal Medicine, 1974*

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Schulz, Rudolph W., B.S. Northwestern 1954, M.A. Stanford 1955, Ph.D. Northwestern 1958; *professor, Psychology, 1960 (1966)*

Schulze, John H., B.S.Ed. Kansas State Teachers 1940, M.F.A. Iowa 1948; *professor, School of Art and Art History, 1948 (1961)*

Schulze, Konrad S., B.S. Munich (Germany) 1965, M.D. Heidelberg (Germany) 1968; *assistant professor, Internal Medicine, 1975 (1977)*

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Schweer, Kathryn D., B.S.N. Iowa 1961, M.A. 1971, Ph.D. 1975; *assistant professor, Nursing, 1971*

Schweitzer, John W., A.B. Thomas More 1960, M.S. Cincinnati 1962, Ph.D. 1966; *professor, Physics and Astronomy, 1966 (1978)*

Schweser, Gilbert C., B.S. Missouri School of Mines 1966, M.B.A. Missouri 1968, Ph.D. Georgia 1976; *assistant professor, Business Administration, 1976*

Scott, M. Gladys, B.A. DePauw 1927, M.A. Iowa 1931, Ph.D. 1937; *professor emerita, Physical Education and Dance, 1934 (1974)*

Scott, William E., B.A. Iowa 1959, M.S. 1962, M.D. 1964; *associate professor, Ophthalmology, 1971 (1975)*

Scranton, James R., B.A. Iowa 1959, Ph.D. 1964; *associate professor, Anatomy, 1967 (1970)*

Scriabine, Helene, M.A. Leningrad (U.S.S.R.) 1941, Ph.D. Syracuse 1962; *professor emerita, Russian, 1960 (1974)*

Scurletis, Theodore D., B.S. Pittsburgh 1947, M.D. 1951, M.Ph. North Carolina 1972; *professor, Pediatrics, 1975*

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Seabury, Hugh F., B.A. Iowa State Teachers 1928, M.A. Iowa 1933, Ed.D. Columbia 1938; *professor emeritus, Speech and Dramatic Art and Secondary Education, 1948 (1974)*

Searle, Gordon W., B.S. Illinois 1941, M.D. 1945, M.S. Northwestern 1949, Ph.D. 1951; *associate professor, Physiology and Biophysics, 1952 (1955)*

Searls, James C., B.A. Cornell 1950, D.D.S. Iowa 1955, Ph.D. 1966; *assistant professor, Anatomy and Family Dentistry, 1964 (1966)*

Seebohm, Paul M., B.A. Cincinnati 1938, M.D. 1941; *professor, Internal Medicine, 1949 (1959)*

Seiberling, Frank, B.A. Princeton 1931, Ph.D. Chicago 1948; *professor emeritus, School of Art and Art History, 1959 (1976)*

Semken, Holmes A., Jr., B.S. Texas 1958, M.S. 1960, Ph.D. Michigan 1965; *professor, Geology, 1965 (1973)*

Seyfried, Shirley A., B.S. Northern Illinois 1964, M.A. Washington 1967; *assistant professor, Nursing, 1967 (1974)*

Sgontz, Larry G., B.A. Wooster 1958, M.A. Illinois 1960, Ph.D. 1964; *associate professor, Economics, 1964 (1968)*

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Shannon, Lyle W., B.A. Cornell 1942, M.A. Washington 1947, Ph.D. 1951; *professor, Sociology, 1962*

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Shepardson, Richard D., B.A. Chico State 1960, M.A. San Jose State 1968, Ph.D. Texas 1972; *associate professor, Early Childhood and Elementary Education, 1972 (1976)*

Sherburne, Alan R., B.A. Iowa 1962, M.D. 1965; *clinical assistant professor, Anesthesia, 1977*

Sherman, Barry M., A.B. Michigan 1964, M.D. 1966; *professor, Internal Medicine, 1971 (1978)*

Sherman, Dorothy, B.A. Iowa 1931, M.A. 1938, Ph.D. 1951; *professor emeritus, Speech Pathology and Audiology, 1948 (1972)*

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Shirazi, Siroos S., P.C.B. Shiraz (Iran) 1959, M.D. 1965; *associate professor, Surgery, 1972 (1976)*

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Shutler, Richard, Jr., A.B. California (Berkeley) 1949, M.A. 1950, Ph.D. Arizona 1961; *professor, Anthropology, 1972*

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Sickels, William J., B.S. Iowa State 1969, M.D. Iowa 1973; *assistant professor, Radiology, 1977*

Siddiqui, Jaleel Y., M.B.B.S. Karachi (Pakistan) 1961; *clinical assistant professor, Internal Medicine, 1976*

Siebert, Calvin D., B.A. Kansas 1958, M.A. 1960, Ph.D. California (Berkeley) 1966; *professor, Economics, 1965 (1975)*

Silverstone, Leon M., B.Ch.B., L.D.S., R.C.S. Leeds (England) 1964, Ph.D. Bristol (England) 1967, D.D.S.C. Leeds (England) 1971; *professor, Pedodontics, 1976*

Silverstone, Susan P., B.Ch.D. Leeds (England) 1965; *instructor, Oral Pathology and Diagnosis, 1976*

Simms, John, B.M. Curtis Institute of Music 1947, M.A. Iowa 1950; *professor, School of Music, 1949 (1959)*

Simon, J. Richard, B.B.A. Wisconsin 1951, M.A. 1953, Ph.D. 1955; *professor, Psychology and Systems Engineering, 1957 (1968)*

Simon, Jonathon K., A.B. Columbia 1964, M.A. Wisconsin 1965, Ph.D. 1969; *associate professor, Mathematics, 1969 (1974)*

Simpson, Roger A., A.B. Iowa 1949, M.D. 1952; *clinical associate professor, Otolaryngology and Maxillofacial Surgery, 1976*

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Sinicropi, Anthony V., B.A. St. Bonaventure 1956, M.I.L.R. Cornell 1958, Ph.D. Iowa 1968; *John F. Murray professor, Business Administration, 1968 (1973)*

Sippy, Francis H., B.S. Seattle 1949, M.Ed. Iowa 1950; *assistant professor, Oral Pathology and Diagnosis, 1967 (1976)*

Six, Erich W., M.A. Frankfurt (Germany) 1949, Ph.D. 1954; *professor, Microbiology, 1960 (1973)*

Sjoerdsma, Theodore J., A.B. Calvin 1954, M.A.T. Michigan State 1961, Ph.D. Iowa 1975; *associate professor, Computer Science, 1967*

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Skibba, Joseph L., B.S. Marquette 1962, M.D. 1967, Ph.D. Wisconsin 1970; *assistant professor, Surgery, 1976*

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Slattery, Thomas W., B.S. Iowa 1950, M.S. 1951; *clinical assistant professor, Pharmacy, 1961 (1976)*

Slatton, Yvonne L., B.S. Middle Tennessee State 1960, M.S. North Carolina 1965, Ph.D. Iowa 1970; *assistant professor, Physical Education and Dance, 1964 (1970)*

Slifer, Eleanor H., B.S. Temple 1923, M.S. Pennsylvania 1926, Ph.D. Pennsylvania State 1930; *professor emeritus, Zoology, 1931 (1967)*

Small, Arnold M., Jr., B.A. San Diego State 1951, M.S. Wisconsin 1953, Ph.D. 1954; *professor, Speech Pathology and Audiology and Psychology, 1958 (1964)*

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Smith, Afton, B.S. Columbia 1922, M.A. 1927; *assistant professor emeritus, Child Behavior and Development, 1933 (1954)*

Smith, Dale F., B.A. Colorado 1967, B.S. Kansas 1975, M.S. Wisconsin 1977; *clinical assistant professor, Pharmacy, 1978*

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Smith, Forrest W., B.S.M. Illinois 1959, M.D. 1961; *clinical assistant professor, Family Practice, 1975*

Smith, Fred G., Jr., B.S. California (Los Angeles) 1951, M.D. 1955; *professor, Pediatrics, 1973*

Smith, Harry R., B.A. St. Lawrence 1957, M.P.A. Michigan 1959; *assistant professor, Institute of Public Affairs, 1960*

Smith, Ian Maclean, F.R.F.P.S. Glasgow (Scotland) 1947, M.D. 1944; *professor, Internal Medicine, 1955 (1965)*

Smith, Jeanne K., B.A. Iowa 1933, M.A. 1937; *associate professor emerita, Otolaryngology and Maxillofacial Surgery, 1953 (1978)*

Smith, Jeanne M., M.D. Toronto (Canada) 1942; *associate professor, Internal Medicine, 1955 (1972)*

Smith, John H., B.S. Missouri 1960, C.P.A. 1962, M.A. 1963, Ph.D. Illinois 1967; *professor, Accounting, 1966 (1976)*

Smith, Lloyd L., B.A. State College of Iowa 1953, M.A. Iowa 1954, Ph.D. 1956; *professor, Early Childhood and Elementary Education, 1956 (1965)*

Smith, Lula E., B.S. Columbia 1919, M.A. New York 1922; *associate professor emerita, Home Economics, 1928 (1959)*

Smith, Mary Lou, B.S. St. Ambrose 1959, M.A. 1971; *assistant professor, Nursing, 1972*

Smith, Max L., D.D.S. Iowa 1946; *adjunct professor, Removable Prosthodontics, 1975*

Smith, Ray V., D.D.S. Iowa 1914; *professor emeritus, Dental Hygiene, 1918 (1959)*

Smith, Robert C., B.A. Iowa 1959, M.D. 1962; *clinical associate professor, Internal Medicine, 1977*

Smith, Ronald C., D.D.S. Iowa 1969, M.S. 1977; *adjunct instructor, Preventive and Community Dentistry, 1977*

Smith, Theodore F., B.S.M.E. Illinois 1963, M.S.M.E. 1965, Ph.D. 1972; *associate professor, Energy Engineering, 1971 (1976)*

Snider, Bill Carl F., B.A. Wichita 1942, M.A. Iowa 1951, Ph.D. 1955; *professor, Educational Psychology, Measurement and Statistics, 1956 (1974)*

Snider, Kenneth A., M.D. Liverpool (England) 1973; *clinical instructor, Family Practice, 1978*

Snider, Mildred, B.A. Iowa 1938, M.A. Smith 1946; *professor emerita, School of Social Work, 1951 (1977)*

Snitzer, James G., B.A. California (Los Angeles) 1973, M.F.A. Art Institute of Chicago 1976; *instructor, School of Art and Art History, 1976*

Snow, Peter G., B.A. Texas Technological 1958, M.A. 1960, Ph.D. Virginia 1963; *professor, Political Science, 1962 (1970)*

Soderberg, Gary L., B.A. Augustana 1960, Physical Therapy Certificate Iowa 1961, M.A. 1962, Ph.D. Pennsylvania State 1971; *associate professor, Physical Therapy, 1972 (1978)*

Sokoll, Martin D., B.S. Steubenville 1954, M.D. Pittsburgh 1958; *professor, Anesthesia, 1963 (1973)*

Solbrig, Ingeborg H., B.A. California State (San Francisco) 1964, M.A. Stanford 1966, Ph.D. 1969; *associate professor, German, 1975*

Soldofsky, Robert M., B.S.C. St. Louis 1942, M.A. Washington (Missouri) 1948, Ph.D. 1954; *professor, Business Administration, 1954 (1963)*

Soll, David R., B.A. Wisconsin 1964, M.A. 1968, Ph.D. 1969; *associate professor, Zoology, 1972 (1976)*

Solomons, Gerald, M.D. Royal College of Physicians and Surgeons (Edinburgh) 1943, D.C.N. Royal College of Physicians and Surgeons (England) 1948; *professor, Pediatrics, 1962 (1969)*

Solomons, Hope, B.A. Clark 1952, A.M. Wellesley 1954, Ed.D. Boston 1957; *associate professor, Nursing, 1967*

Solursh, Michael, B.A. California (Los Angeles) 1964, Ph.D. Washington 1969; *associate professor, Zoology, 1969 (1973)*

Soper, Robert T., B.A. Cornell 1949, M.D. Iowa 1952; *professor, Surgery, 1957 (1968)*

Spalding, James C., B.A. Illinois 1942, B.D. Hartford Theological Seminary 1945, Ph.D. Columbia 1950; *professor, School of Religion, 1956 (1968)*

Spalj, Nancy E., B.S.N. Iowa 1963, M.A. 1975; *instructor, Nursing, 1976*

Spaziani, Eugene, B.S. California (Los Angeles) 1952, M.A. 1954, Ph.D. 1958; *professor, Zoology, 1959 (1968)*

Spear, William M., M.D. Queens (Canada) 1927; *professor emeritus, Internal Medicine, 1957 (1969)*

Spector, Arthur A., B.A. Pennsylvania 1956, M.D. 1960; *professor, Biochemistry and Internal Medicine, 1968 (1975)*

Spellman, George, B.S. St. Ambrose 1940, M.D. Iowa 1943, F.A.C.P. College of Physicians 1964; *clinical associate professor, Internal Medicine, 1976*

Spencer, Donald L., B.S.M.E. Iowa 1942, M.S. 1948, Ph.D. Minnesota 1965; *associate professor, Energy Engineering, 1956 (1967)*

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Spiker, Charles C., B.A. San Francisco State 1948, M.A. Iowa 1949, Ph.D. 1951; *professor, Psychology, 1951 (1959)*

Spires, C. James, D.D.S. Illinois 1960; *assistant professor, Oral Surgery, 1975*

Spitzer, Alan B., B.A. Swarthmore 1948, M.A. Columbia 1949, Ph.D. 1955; *professor, History, 1957 (1963)*

Spitzer, Anne L., B.A. Swarthmore 1950, Ph.D. Harvard 1966, J.D. Iowa 1975; *clinical instructor, Law, 1977*

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Spratt, James L., A.B. Chicago 1953, Ph.D 1957, M.D. 1961; *professor, Pharmacology, 1961 (1971)*

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Springer, Owen L., B.S. Indiana State Teachers 1949, M.Ed. Illinois 1953, Ed.D. Michigan State 1964; *associate professor, Educational Administration, 1968*

Squier, Christopher A., B.A. Cambridge (England) 1963, M.A. 1967, Ph.D. London Hospital Medical (England) 1967; *associate professor, Oral Pathology and Diagnosis, 1975*

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Staley, Robert N., B.S. Minnesota 1957, D.D.S. 1959, M.A. Chicago 1967, M.S. State University of New York 1970; *associate professor, Orthodontics, 1970 (1973)*

Stamler, Frederic W., B.A. Iowa 1939, M.D. 1943; *professor, Pathology, 1947 (1961)*

Stamm, Carol L., A.B. Berea 1967, M.A. Eastern Kentucky 1968, Ph.D. Wisconsin 1974; *assistant professor, Physical Education and Dance, 1974*

Staples, Lawrence F., B.S. New Hampshire 1949, M.S. 1950, M.D. Iowa 1950; *clinical associate professor, Internal Medicine, 1967 (1974)*

Starck, Kenneth, B.A. Wartburg 1956, M.A. Missouri 1960, Ph.D. Southern Illinois 1968; *professor, School of Journalism, 1974 (1976)*

Stark, Herald, B.S.Ed. Nebraska State Teachers 1930, M.A. Iowa 1934; *professor emeritus, School of Music, 1934 (1976)*

Stay, Barbara A., A.B. Vassar 1947, M.A. Radcliffe 1949, Ph.D. 1953; *professor, Zoology, 1967 (1977)*

Stearns, Genevieve, B.S. Carleton 1912, M.S. Illinois 1920, Ph.D. Michigan 1928; *professor emerita, Orthopaedic Surgery 1920 (1958)*

Steele, Oliver, B.S. Auburn 1949, M.S. 1951, Ph.D. Virginia 1965; *professor, English, 1967 (1974)*

Steele, William J., B.A. Pennsylvania 1951, Ph.D. 1958; *professor, Pharmacology, 1967 (1974)*

Stegink, Lewis D., B.A. Hope 1958, M.S. Michigan 1961, Ph.D. 1963; *professor, Pediatrics and Biochemistry, 1963 (1976)*

Stehbens, James A., B.S. Iowa State 1962, Ph.D. Iowa 1967; *associate professor, Pediatrics, 1967 (1972)*

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Stephens, Ralph I., B.S.G.E. Illinois 1957, M.S. 1960, Ph.D. Wisconsin 1965; *professor, Materials Engineering, 1965 (1972)*

Stevens, Harriet, B.A. Iowa 1932, M.S. 1934; *assistant professor emerita, Home Economics, 1951 (1975)*

Stevens, Reggie H., B.S. Iowa 1968, M.S. 1970, Ph.D. 1972; *assistant professor, Radiology, 1975 (1978)*

Stevens, Wendell C., M.D. Iowa 1956; *professor, Anesthesia, 1978*

Stevenson, Calvin R., B.S., M.A. Columbia 1947, Ph.D. Iowa 1967; *adjunct assistant professor, Educational Psychology, Measurement and Statistics 1970*

Stevenson, Richard A., B.B.A. St. Bonaventure 1961, M.B.A. Michigan State 1962, Ph.D. DePaul 1965; *professor, Business Administration, 1967 (1976)*

Stewart, Mark A., B.A. Cambridge (England) 1953, M.D. St. Thomas Hospital Medical School (England) 1956; *Haller professor, Psychiatry, 1972*

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Stone, Albert E., B.A. Yale 1949, M.A. Columbia 1955, Ph.D. Yale 1957; *professor, English and American Studies Program, 1977*

Stone, Franklin D., B.A. Jamestown 1938, M.A. Iowa 1942, Ph.D. 1963; *professor, Educational Administration, 1964 (1968)*

Stone, Thomas H., B.A. Michigan 1965, M.A. Minnesota 1967, Ph.D. 1969; *associate professor, Business Administration, 1969 (1973)*

Stoner, James, B.S. Iowa State 1966, M.S. Iowa 1972, Ph.D. Northwestern 1977; *assistant professor, Systems Engineering, 1974*

Strait, George A., B.A. Harvard 1936, LL.B. Suffolk 1949; *professor, Law, 1976*

Stratton, John R., B.A. Illinois 1957, M.A. 1959, Ph.D. 1963; *associate professor, Sociology, 1964 (1968)*

Strauss, John S., B.S. Yale 1946, M.D. 1950; *professor, Dermatology, 1978*

Strauss, Ronald G., B.S. Capital 1961, M.D. Cincinnati 1965; *associate professor, Pediatrics, 1976*

Strottmann, M. Paul, B.A. Iowa State Teachers 1951, M.D. Iowa 1958; *associate professor, Internal Medicine and Orthopaedic Surgery, 1962 (1975)*

Stroud, James B., B.A. Lincoln Memorial 1921, M.A. Chicago 1927, Ph.D. 1930; *professor emeritus, Educational Psychology, Measurement and Statistics, 1938 (1965)*

Stroyan, K.D., B.S. Drexel Institute 1967, Ph.D. California Institute of Technology 1971; *associate professor, Mathematics, 1973 (1976)*

Strug, Robert A., D.D.S. Loyola 1971; *adjunct assistant professor, Removable Prosthodontics, 1972 (1977)*

Stuit, Dewey B., B.S. Illinois 1931, M.S. 1932, Ph.D. 1934; *professor emeritus, Psychology, 1938 (1977)*

Stwalley, William C., B.S. California Institute of Technology 1964, Ph.D. Harvard 1969; *professor, Chemistry, 1968 (1975)*

Summers, Robert W., B.S. Michigan State 1961, M.D. Iowa 1965; *associate professor, Internal Medicine, 1970 (1974)*

Summerville, Suzanne, A.B. Randolph-Macon Woman's 1958, M.Mus. Houston 1968; *assistant professor, School of Music, 1975*

Sutherland, Donald W., B.A. Swarthmore 1953, D.Phil. Oxford (England) 1957; *professor, History, 1958 (1967)*

Svare, Carl W., B.S. Minnesota 1955, D.D.S. 1964, Ph.D. Pennsylvania 1969; *professor, Fixed Prosthodontics and Materials Engineering, 1969 (1977)*

Swanson, Elizabeth A., B.S.N. Iowa 1969, M.A. 1975; *assistant professor, Nursing, 1974*

Swanson, Leslie W., M.D. Iowa 1936; *clinical professor, Internal Medicine, 1976*

Swartz, Conrad, B.E. Cooper Union 1966, M.S. California Institute of Technology 1968, Ph.D. Minnesota 1972, M.D. 1974; *assistant professor, Psychiatry, 1978*

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Swenson, Charles A., B.S. Gustavus Adolphus 1955, Ph.D. Iowa 1959; *professor, Biochemistry, 1960 (1972)*

Swett, Keene, B.S. Tufts 1955, M.S. Colorado 1961, Ph.D. Edinburgh (Scotland) 1965; *professor, Geology, 1966 (1974)*

Swisher, Robert D., A.B. Indiana 1966, M.L.S. 1968, Ph.D. 1975; *assistant professor, School of Library Science, 1975*

Szafran, Robert F., B.A. Loyola University of Chicago 1971, M.A. Wisconsin 1974, Ph.D. 1977; *assistant professor, Sociology, 1977*

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Tade, William H., B.A. Iowa 1950, D.D.S. 1954, M.S. 1960, Ph.D. 1961; *professor, Oral Pathology and Diagnosis, 1956 (1971)*

Talbott, Albert D., B.S. Iowa State 1958, M.A. Michigan State 1961, Ph.D. 1968; *professor, School of Journalism, 1967 (1975)*

Tanna, Vasantkumar L., M.B.B.S. Bombay (India) 1959; *associate professor, Psychiatry, 1971 (1977)*

Tannous, Raymond, M.D. Faculty of Medicine and Pharmacy (France) 1971; *assistant professor, Pediatrics, 1977*

Taranik, James V., B.Sc. Stanford 1964, Ph.D. Colorado School of Mines 1971; *adjunct professor, Geology, 1971*

Taraska, Stanley P., B.Sc. Manitoba (Canada) 1971, M.D. 1971; *clinical assistant professor, Pediatrics, 1977*

Tardy, Dwight C., B.A. San Diego State 1962, Ph.D. Washington 1967; *associate professor, Chemistry, 1969 (1974)*

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Taunton, Martha, B.A. Baylor 1968, M.A. Illinois 1971, Ed.D. 1978; *assistant professor, School of Art and Art History and Secondary Education, 1976*

Taylor, Jerry W., B.S.Ph. Texas 1974, Pharm.D. 1977; *clinical assistant professor, Pharmacy, 1977*

Taylor, Michael J., B.A. Iowa 1968, M.D. 1970; *clinical assistant professor, Psychiatry, 1976 (1978)*

Teague, Michael L., B.A. Colorado State 1968, M.Ed. 1969, Ed.D. Northern Colorado 1976; *assistant professor, Recreation Education, 1975 (1976)*

Tedford, Alberta A., B.A. Minnesota 1954, M.A. Chicago 1958; *assistant professor, Nursing, 1975*

Temkin, Jack, B.A. Brooklyn 1967, M.A. Wisconsin 1973, Ph.D. 1976; *assistant professor, Philosophy, 1974 (1976)*

Tenbroeke, James E., B.A. Rice 1962, M.S. Baylor 1967, M.D. 1967; *clinical assistant professor, Dermatology, 1973*

Tephly, Thomas R., B.S. Connecticut 1957, Ph.D. Wisconsin 1962, M.D. Minnesota 1965; *professor, Pharmacology, 1971*

Ter Haar, John A. A., B.A. Iowa 1954, M.A. 1955, Ph.D. 1957; *professor, German, 1964 (1975)*

Tesdall, Donald J., D.V.M. Iowa State 1962, M.D. Iowa 1966; *clinical assistant professor, Family Practice, 1974*

Tester, Allen C., B.A. Kansas 1921, M.A. 1921, Ph.D. Wisconsin 1929; *professor emeritus, Geology, 1925 (1940)*

Tewfik, Hamed H., M.B. Alexandria (Egypt) 1959, D.M.R. 1962, M.D. 1967; *associate professor, Radiology, 1972 (1977)*

Thames, Marc D., B.A. Lehigh 1966, M.D. Medical College of Virginia 1970; *assistant professor, Internal Medicine, 1977*

Thatcher, James W., M.S. Iowa 1968; *adjunct assistant professor, Oral Surgery, 1965 (1968)*

Thayer, David L., B.S. Lewis and Clark 1952, M.A. Iowa 1955, Ph.D. 1960; *professor, Speech and Dramatic Art, 1955 (1968)*

Thayer, Keith E., B.A. Cornell 1951, D.D.S. Iowa 1955, M.S. 1956; *professor, Fixed Prosthodontics, 1955 (1963)*

Thelen, Ernest O., B.A. Nebraska 1945, M.D. 1947; *professor, Internal Medicine, 1951 (1962)*

Thelsen, Gary L., B.A. Michigan 1968, M.A. Chicago 1975; *instructor, Education Interdivisional and Sociology, 1978*

Thelsen, William M., B.A. Loras 1960, M.S.W. Washington (Missouri) 1968, Ph.D. 1972; *associate professor, School of Social Work, 1975*

Theobold, Richard V., B.S. Iowa 1959, M.S. 1956; *clinical assistant professor, Pharmacy, 1977*

Thietje, Walter C., B.A. South Dakota 1929; *assistant professor emeritus, Museum of Natural History, 1931 (1971)*

Thomas, Barbara S., B.S. Iowa State 1951, M.A. Iowa 1964, Ph.D. 1968; *associate professor, Nursing, 1971 (1974)*

Thomas, Julianne H., B.S. George Washington 1967, M.D. Nebraska 1971; *clinical assistant professor, Pediatrics, 1976*

Thomas, Karen A., B.S.N. Iowa 1972, M.S. 1978; *instructor, Nursing, 1977*

Thompson, Duane E., B.S. Iowa State 1953, M.S. 1954, Ph.D. Iowa 1969; *associate professor, Center for Labor and Management, 1969 (1971)*

Thompson, Gene L., B.F.A. California College of Arts and Crafts 1963, M.F.A. Cranbrook Academy of Art 1965; *associate professor, School of Art and Art History, 1976*

Thompson, H. Stanley, B.A. Minnesota 1953, M.S. Iowa 1966, M.D. Minnesota 1961; *professor, Ophthalmology, 1967 (1976)*

Thompson, John R., B.A. Iowa 1948, M.A. 1951, D.D.S. 1956; *adjunct assistant professor, Removable Prosthodontics, 1964 (1977)*

Thompson, John S., B.A. California (Berkeley) 1949, M.D. Chicago 1953; *professor, Internal Medicine, 1969*

Thompson, Robert G., B.S. Iowa 1962, M.D. 1965; *associate professor, Pediatrics, 1974*

Thomson, John D., B.A. Morningside 1933, M.S. Chicago 1936, Ph.D. Iowa 1940; *associate professor emeritus, Physiology and Biophysics, 1946 (1978)*

Thorburn, Bruce R., D.D.S. Iowa 1962; *adjunct assistant professor, Orthodontics, 1967 (1969)*

Thornton F. Eberle, M.D. Iowa 1937; *clinical assistant professor, Orthopaedic Surgery, 1977*

Thostenson, Marvin S., B.A. Luther 1934, M.A. Iowa 1941, Ph.D. 1953; *associate professor, School of Music, 1954 (1963)*

Tilliss, Terri, B.S. Iowa 1975, M.S. 1977; *assistant professor, Dental Hygiene, 1977*

Timmins, Janet A., B.S.N. Iowa 1972, M.S. 1977; *instructor, Nursing, 1977*

Tipton, Charles M., B.S. Springfield 1952, M.S. Illinois 1953, Ph.D. 1962; *professor, Physical Education and Physiology and Biophysics, 1963 (1973)*

Tomanek, Robert J., B.S. Omaha 1959, M.A. Iowa 1960, Ph.D. 1967; *associate professor, Anatomy, 1972 (1976)*

Tomasini, Wallace J., B.A. Michigan 1949, M.A. 1950, Ph.D. 1953; *professor, School of Art and Art History, 1957 (1964)*

Tomblin, J. Bruce, B.A. LaVerne 1966, M.A. Redlands 1967, Ph.D. Wisconsin 1970; *associate professor, Speech Pathology and Audiology, 1972 (1977)*

Ton-That, Tuong, M.A. California (Irvine) 1971, Ph.D. 1974; *associate professor, Mathematics, 1975 (1978)*

Top, Franklin H., B.A. Calvin 1925, M.D. Pennsylvania 1928, M.P.H. Johns Hopkins 1935; *professor emeritus, Preventive Medicine and Environmental Health, 1952 (1971)*

Torney, Dennis L., B.S. Saint Mary's (California) 1968, D.D.S. Creighton 1971, M.S. Iowa 1974; *assistant professor, Operative Dentistry, 1971 (1975)*

Torres, Alfonso, B.S. Sonora (Mexico) 1962, M.D. National University of Mexico 1968; *clinical assistant professor, Pediatrics, 1977*

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Tracy, Roger D., B.A. Iowa 1966, M.S. 1969; *adjunct assistant professor, Preventive Medicine and Environmental Health, 1973*

Trank, Douglas M., B.A. Kearney State 1967, M.A. 1970, Ph.D. Utah 1973; *assistant professor, Rhetoric and Secondary Education, 1974*

Trimble, Richard B., B.A. Yale 1962, M.D. Baylor 1966; *clinical assistant professor, Internal Medicine, 1977*

Triplett, June L., B.S. Minnesota 1943, M.P.H. Michigan 1955, Ed.D. 1968; *professor, Nursing, 1968 (1972)*

Trummel, J. M., B.S. Illinois 1939, M.S. Iowa State 1940, Ph.D. Iowa 1960; *professor, Materials Engineering, 1941 (1961)*

Tsuang, Ming-Tso, M.D. National Taiwan 1957, Ph.D. London (England) 1965; *professor, Psychiatry and Preventive Medicine and Environmental Health, 1972 (1975)*

Tucker, Norval, B.F.A. Iowa 1951, M.F.A. 1955, Ph.D. 1958; *associate professor, School of Art and Art History, 1955 (1963)*

Tung, Su-Hsin Liao, D.D.S. Missouri (Kansas City) 1975; *adjunct instructor, Removable Prosthodontics, 1976*

Turner, Darwin T., B.A. Cincinnati 1947, Ph.D. Chicago 1956; *professor, English, 1971*

Turner, Lloyd A., B.A. Wisconsin 1972; *instructor, Urban and Regional Planning, 1977*

Turner, Thomas, B.A. Chicago 1935, M.A. 1936, Ph.D. Iowa 1942; *professor, School of Music, 1942 (1960)*

Tuttle, Sherwood D., B.S. New Hampshire 1939, M.S. Washington State 1941, M.A. Harvard 1953, Ph.D. 1953; *professor, Geology, 1952 (1961)*

Tyndall, Edward P. T., B.A. Richmond 1912, Ph.D. Cornell 1922; *professor emeritus, Physics and Astronomy, 1923 (1960)*

Tyree, Ronald W., B.A. Iowa 1954, M.A. 1955, Ph.D. 1957; *associate professor, School of Music, 1965 (1971)*

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Ungar, Steven R., B.A. Wisconsin 1966, M.A. 1968, Ph.D. Cornell 1973; *assistant professor, French and Italian and Comparative Literature, 1976*

Updegraf, Ruth, B.A. Vassar 1923, Ph.D. Iowa 1928; *professor emerita, Child Behavior and Development, 1928 (1970)*

Updegraff, Clarence M., LL.B. Iowa 1916, B.A. George Washington 1922, S.J.D. Harvard 1925; *professor emeritus, Law, 1926 (1961)*

Urbscheit, Nancy L., B.S. State University of New York 1968, M.A. State University of New York (Buffalo) 1971, Ph.D. 1973; *assistant professor, Physical Therapy, 1976*

Valanis, Kyriakos C., B.Sc. London (England) 1955, M.Sc. 1957, Ph.D. Purdue 1963; *professor, Materials Engineering, 1969*

Van Allen, James A., B.S. Iowa Wesleyan 1935, M.S. 1936, Ph.D. 1939, D.Sc. Iowa Wesleyan 1951, D.Sc. Grinnell 1957, D.Sc. Coe 1958, D.Sc. Cornell 1959, D.Sc. Michigan 1960, D.Sc. Northwestern 1960, D.Sc. Dubuque 1960, D.Sc. Illinois (Jacksonville) 1963, D.Sc. Butler 1966, D.Sc. Boston 1966, D.Sc. Southampton 1967, D.Sc. Augustana 1969; *Carver professor, Physics and Astronomy, 1951*

Van Allen, Maurice W., B.A. Iowa Wesleyan 1939, M.D. Iowa 1942; *professor, Neurology, 1959 (1965)*

Van Cura, John W., B.M. Peabody Conservatory 1965, M.M. 1965, D.M. Florida State 1976; *associate professor, School of Music, 1976*

Van Demark, Ann, B.A. Omaha 1959, M.A. Iowa 1962, Ph.D. Indiana 1964; *clinical assistant professor, Speech Pathology and Audiology, 1972*

Van Demark, Duane R., B.A. Hiram 1958, M.A. Iowa 1962, Ph.D. 1962; *professor, Otolaryngology and Maxillofacial Surgery and Speech Pathology and Audiology, 1965 (1975)*

Van Dyke, Lauren A., B.A. Morningside 1928, M.A. Missouri 1934; *professor emeritus, Secondary Education, 1941 (1974)*

Van Dyke, Vernon B., B.A. Manchester 1933, M.A. Chicago 1934, Ph.D. 1937; *professor, Political Science, 1949 (1954)*

Van Gilder, John C., B.A. West Virginia 1957, B.S. 1959, M.D. Pittsburgh 1961; *professor, Surgery, 1976*

Van Kirk, Owen C., B.A. Andrews 1962, M.D. Loma Linda 1968; *associate professor, Radiology, 1977*

Van Lith, Paul, M.D. Leiden (Netherlands) 1952; *clinical associate professor, Internal Medicine, 1975*

Van Orden, Dianna E., B.S. Northwestern 1953, M.D. 1956; *professor, Obstetrics and Gynecology, 1967 (1978)*

Van Orden, Lucas S., III, B.S. Northwestern 1950, M.S. 1952, M.D. 1956, Ph.D. Yale 1966; *professor, Pharmacology and Psychiatry, 1967 (1973)*

Van Voorhis, Lee W., M.D. Iowa 1959; *clinical associate professor, Obstetrics and Gynecology, 1977*

Vaughan, Emmett J., B.A. Creighton 1960, M.A. Nebraska 1962, Ph.D. 1963; *J.E. Partington professor, Business Administration, 1963 (1971)*

Veehoff, Joseph L., B.A. Buena Vista 1960, M.S.W. Iowa 1963; *adjunct assistant professor, School of Social Work, 1978*

Vernon, David H., A.B. Harvard 1949, LL.D. 1952, LL.M. New York 1953, J.S.D. 1960; *professor, Law, 1966*

Vestal, Allan D., B.A. DePauw 1943, LL.B. Yale 1949; *Carver professor, Law, 1948 (1957)*

Vestling, Carl S., B.A. Carleton 1934, Ph.D. Johns Hopkins 1938; *professor, Biochemistry, 1963*

Vetter, Arthur F., B.A. Coe 1939, M.S. North Carolina 1956; *associate professor, Materials Engineering, 1962 (1965)*

Vlastos, Stephen G., A.B. Princeton 1966, Ph.D. California (Berkeley) 1977; *assistant professor, History, 1976 (1977)*

Voots, Richard, B.S. New York 1944, Ph.D. Iowa 1955; *assistant professor, Otolaryngology and Maxillofacial Surgery, 1955 (1961)*

Voxman, Himie, B.S.Ch.E. Iowa 1933, M.A. 1934; *professor, School of Music, 1938 (1951)*

Wachal, Robert S., B.A. Minnesota 1952, M.S. Wisconsin 1959; Ph.D. 1966; *professor, Linguistics, 1964 (1975)*

Waddell, Sharon A., B.S. Colorado, M.S. Boston 1977; *instructor, Nursing, 1977*

Wahlke, John C., B.A. Harvard 1939, M.A. 1947, Ph.D. 1952; *professor, Political Science, 1966*

Walker, Donald H., Jr., A.B. Carleton 1954, M.A. Indiana 1959, Ph.D. Pennsylvania 1966; *associate professor, Microbiology, 1970 (1976)*

Walker, George W., B.A. Michigan State 1950, M.A. 1964, M.F.A. 1965; *associate professor, School of Art and Art History and Secondary Education, 1966 (1972)*

Walker, James A., D.D.S. Iowa 1962; *adjunct instructor, Preventive and Community Dentistry, 1976*

Walker, Jerry D., B.A. Iowa 1959, D.D.S. 1962, M.A. 1969; *associate professor, Pedodontics, 1968 (1976)*

Walker, John A., B.S. Iowa 1972; *clinical instructor, Pharmacy, 1973*

Walker, Kevin P., B.S. London (England) 1964, M.S. Union 1971, Ph.D. Rensselaer Polytechnic 1976; *assistant professor, Materials Engineering, 1976*

Wallace, George J., B.A. Yale 1964, LL.B. Virginia 1967; *associate professor, Law, 1968 (1972)*

Wallace, Peter D., A.B. Grinnell 1965, M.D. Iowa 1969; *clinical assistant professor, Pediatrics, 1974*

Wallace, Robert B., B.S.M. Northwestern 1964, M.D. 1967, M.Sc. State University of New York (Buffalo) 1972; *associate professor, Preventive Medicine and Environmental Health and Internal Medicine, 1972 (1975)*

Waltman, Paul E., B.S. St. Louis 1952, M.A. Baylor 1954, M.A. Missouri 1960, Ph.D. 1962; *professor, Mathematics, 1965 (1968)*

Walton, Jonathan W., B.A. Illinois (Chicago Circle) 1969, M.A. Princeton 1974; *instructor, History, 1977*

Walz, Thomas H., B.A. St. Johns 1954, M.S.W. St. Louis 1958, Ph.D. Minnesota 1966; *professor, School of Social Work, 1973*

Wang, Wei-Yeh, B.S. National Taiwan 1966, Ph.D. Missouri 1971; *assistant professor, Botany, 1975*

Ward, Larry D., B.S. Kansas 1966, J.D.1969; *professor, Law, 1972 (1978)*

Ware, Lawrence A., B.E. Iowa 1926, M.S. 1927, Ph.D. 1930, E.E. 1935; *professor emeritus, Information Engineering, 1937 (1969)*

Warner, Emory D., B.S. Iowa 1927, M.D. 1929; *professor emeritus, Pathology, 1930 (1973)*

Wasserman, Edward A., B.A. California (Los Angeles) 1968, Ph.D. Indiana 1972; *associate professor, Psychology, 1972 (1977)*

Waterbury, Charles A., B.A. Iowa 1937, M.D. 1940; *clinical assistant professor, Family Practice, 1977*

Watkins, David H. A.B. Colorado 1937, M.D. 1940, M.S. Minnesota 1947, Ph.D. 1949; *clinical professor, Surgery, 1968*

Watson, Jerry J., B.S. West Texas State 1962, M.A. Michigan State 1971, Ph.D. 1974; *assistant professor, Early Childhood and Elementary Education, 1977*

Watzke, Robert C., B.A. Wisconsin 1950, M.D. 1952; *professor, Ophthalmology, 1958 (1969)*

Wawzonek, Stanley M., B.S. Brown 1935, Ph.D. Minnesota 1939; *professor, Chemistry, 1944 (1952)*

Waziri, Rafiq, B.S. American (Lebanon) 1956, M.D. 1960; *associate professor, Psychiatry, 1966 (1971)*

Webb, John T., A.B. California State (Los Angeles) 1968, Ph.D. California (Berkeley) 1976; *assistant professor, Spanish and Portuguese, 1976*

Weber, Harry B., A.B. Princeton 1950, M.A. Indiana 1958, Ph.D. 1969; *associate professor, Russian, 1966 (1975)*

Weech, Terry L., A.B. Knox 1959, M.S. Illinois 1965, Ph.D. 1972; *assistant professor, School of Library Science, 1976*

Weerts, Theodore C., B.S. Wisconsin 1965, M.S. 1970, Ph.D. 1973; *assistant professor, Psychology, 1972*

Wefel, James S., B.S. Valparaiso 1968, Ph.D. State University of New York (Buffalo) 1972; *adjunct assistant professor, Pedodontics, 1977*

Wei, Stephen H. Y., B.D.S. Adelaide (Australia) 1961, B.D.S. (Hons) 1962, M.D.S. 1965, M.S. Illinois 1967, D.D.S. Iowa 1971; *professor, Pedodontics, 1967 (1974)*

Weiler, John M., B.S. Michigan 1967, M.D. Temple 1971; *assistant professor, Internal Medicine, 1977 (1978)*

Weinberger, Miles, A.B. Pittsburgh 1960, M.D. 1965; *associate professor, Pediatrics and Pharmacology, 1975*

Weingeist, Thomas A., B.A. Earlham 1963, Ph.D. Columbia 1969, M.D. Iowa 1972; *assistant professor, Ophthalmology, 1975 (1976)*

Weinstein, Stuart L., B.A. Illinois 1968, M.D. Iowa 1972; *assistant professor, Orthopaedic Surgery, 1976*

Weiser, Margaret G., B.S. Rutgers 1943, M.S. Florida State 1959, Ed.D. Illinois 1966; *associate professor, Early Childhood and Elementary Education, 1966 (1970*

Weissbort, Daniel, B.A. Cambridge (England) 1956; *assistant professor, English, 1974*

Weissman, Marilyn K., B.S.N. Iowa 1972, M.A. 1976; *instructor, Nursing, 1978*

Welsh, William A., B.S. Northwestern 1961, M.A. 1962, Ph.D. 1965; *professor, Political Science, 1969 (1974)*

Wendler, Arthur J., B.E. Wisconsin State Teachers (LaCrosse) 1929, M.A. Iowa 1932, Ph.D. 1939; *associate professor emeritus, Physical Education, 1937 (1948)*

Wendt, Charles G., B.S.M. Juilliard 1960, M.M. Indiana 1962; *associate professor, School of Music, 1966 (1970)*

Wenger, Jan C., B.S.Ph. South Dakota 1960, M.S. Minnesota 1966; *clinical assistant professor, Pharmacy, 1976*

Wenning, David M., B.S.Ph. Washington 1969, M.S. Iowa 1976; *clinical assistant professor, Pharmacy, 1976 (1977)*

Wertz, Christopher A., B.A. Columbia 1963, M.A. Michigan 1969, Ph.D. 1971; *assistant professor, Russian, 1977*

Wertz, David C., B.S. Loras 1969, D.D.S. Iowa 1974; *adjunct assistant professor, Pedodontics, 1977*

West, James R., B.A. Wichita State 1962, Ph.D. California (Irvine) 1975; *assistant professor, Anatomy, 1976*

West, John C., B.A. Yale 1966, M.D. Pennsylvania 1970; *assistant professor, Surgery, 1977*

West, Jude P., B.A. St. Mary of the Lake 1953, M.B.A. Chicago 1961, Ph.D. Iowa 1969; *associate professor, Center for Labor and Management, 1969*

Weston, Burns H., B.A. Oberlin 1956, LL.B. Yale 1961, J.S.D. 1970; *professor, Law, 1966 (1969)*

Wetrich, David W., B.A. Iowa 1957, M.D. 1960; *clinical assistant professor, Obstetrics and Gynecology, 1971*

Wezeman, Frederick, B.S. Lews Institute 1937, M.E. Chicago 1940, B.L.S. 1946; *professor, School of Library Science, 1966*

Whidden, Ann, B.S. Beloit 1936, M.N. Western Reserve 1939, M.A. Iowa 1957; *associate professor, Nursing, 1954 (1964)*

White, Carl W., B.S. Nebraska 1961, M.D. 1964; *associate professor, Internal Medicine, 1973 (1978)*

Whitehead, F. Eugenia, B.S.H.E. Georgia 1936, M.S.Ed. 1942, D.Sc. Harvard 1951, *professor emerita, Home Economics, 1955 (1978)*

Whitehurst, Carol, B.A. California (Riverside) 1966, M.A. 1973, Ph.D. 1974; *assistant professor, Sociology and American Studies Program, 1973*

Wick, James H., D.D.S. Iowa 1918; *professor emeritus, Operative Dentistry, 1924 (1964)*

Wicklund, Gary A., B.S. Iowa State 1963, M.B.A. Denver 1965, Ph.D. Northwestern 1971; *associate professor, Business Administration, 1967 (1973)*

Widiss, Alan I., B.S. Southern California 1960, LL.B. 1963, LL.M. Harvard 1964; *professor, Law, 1965 (1969)*

Widmer, Reuben B., B.A. Goshen 1940, M.D. Iowa 1943; *associate professor, Family Practice, 1971 (1975)*

Wieting, Stephen G., B.A. Whitworth 1962, B.D. Princeton Theological Seminary 1965, Ph.D. Minnesota 1971; *associate professor, Sociology, 1971*

Wilke, Ulfert S., M.A. Iowa 1947; *professor emeritus, School of Art and Art History, 1968 (1975)*

Willard, Derek H., B.A. Rhode Island 1964, M.A.C. Pennsylvania 1968, Ph.D. Iowa 1975; *assistant professor, Preventive and Community Dentistry, 1974 (1975)*

Williams, Chad L., M.D. Iowa 1968, *clinical assistant professor, Internal Medicine, 1973 (1976)*

Williams, Dean E., B.A. Iowa 1947, M.A. 1949, Ph.D. 1952; *professor, Speech Pathology and Audiology, 1958 (1964)*

Williams, Emma J., B.A. Simpson 1943, M.A. Iowa 1959; *assistant professor, School of Social Work, 1966*

Williams, Glenys O., B.Sc. Wales 1950, M.B.B.Ch. Welsh National School of Medicine (Wales) 1953; *assistant professor, Family Practice, 1974 (1977)*

Williams, Gregory H., B.A. Ball State, M.A. Maryland 1969, J.D. George Washington 1971; *associate professor, Law, 1977*

Williams, Norman E., B.A. Youngstown 1952, M.S. Brown 1954, Ph.D. California (Los Angeles) 1958; *professor, Zoology, 1957 (1967)*

Williams, Patricia A., B.A. Chatham 1970, Wisconsin 1971, 1974; *instructor, Spanish and Portuguese, 1975*

Williams, Terence H., M.D. Manchester (England) 1953, Ph.D. Wales 1960; *professor, Anatomy, 1973*

Williams, Vincent D., D.D.S. Iowa 1957; *clinical instructor, Family Dentistry, 1972*

Williamson, Harold E., B.S. Wisconsin 1953, Ph.D. 1959; *professor, Pharmacology, 1960 (1970)*

Williamson, Samuel H., B.S. Purdue 1962, M.S. 1964, Ph.D. 1968; *associate professor, Economics, 1967 (1972)*

Williamson, Susan H., B.B.A. Iowa 1971, M.B.A. 1976; *instructor, Accounting, 1976*

Wilmeth, J. Richard, B.A. Iowa 1936, M.A. 1939, Ph.D. Cornell 1943; *professor, Sociology, 1950 (1966)*

Wilson, Jim L., A.B. Washington (Missouri) 1966, M.D. Missouri 1970; *assistant professor, Family Practice, 1976*

Wilson, John B., B.A. Coe 1951, D.D.S. Iowa 1955; *adjunct assistant professor, Pedodontics, 1977*

Wilson, John T., B.A. Northern Colorado 1959, M.A. 1962, Ph.D. Florida 1973; *associate professor, Secondary Education, 1973 (1977)*

Wingrove, Frank, D.D.S. Iowa 1973; *adjunct instructor, Periodontics, 1973*

Winnie, John R., B.A. Cornell 1936, M.F.A. Iowa 1941; *associate professor, Speech and Dramatic Art, 1950 (1951)*

Winokur, George, A.B. Johns Hopkins 1944, M.D. Maryland 1947; *Penningroth professor, Psychiatry, 1971*

Wintermeyer, Laverne, M.A. Iowa 1948, M.D. 1961; *clinical assistant professor, Pediatrics, 1971*

Wirtz, John, B.A. Loras 1962, M.S.W. Loyola 1968; *adjunct instructor, School of Social Work, 1978*

Wirtz, Peter G., B.S. Mankato State 1962, M.S. 1966, Ed.D. Nebraska 1970; *assistant professor, Counselor Education, 1974*

Withey, Lynne E., A.B. Smith 1970, Ph.D. California (Berkeley) 1976; *assistant professor, History, 1974 (1976)*

Witte, David L., B.A. St. Olaf 1965, Ph.D. Iowa State 1971; *assistant professor, Pathology, 1973*

Wockenfuss, James, B.A. Wisconsin 1953; *adjunct assistant professor, Speech and Dramatic Art, 1971*

Woerner, Robert F., B.A. Louisville 1950, Ph.D. Indiana 1962; *associate professor, English, 1957 (1966)*

Wolfson, Sara C., B.S. Appalachian State 1957, M.S. North Carolina 1962, Ed.D. Houston 1971; *associate professor, Home Economics and Secondary Education, 1971 (1977)*

Wolfson, Sherwood, Westminster 1953, D.D.S. Pittsburgh 1957, *associate professor, Oral Surgery, 1971 (1976)*

Wollert, James A., B.A. Wisconsin 1966, M.A. 1968, Ph.D. Michigan State 1976; *assistant professor, School of Journalism, 1976*

Wolraich, Mark L., B.A. State University of New York (Harper) 1966, M.D. State University of New York (Buffalo) 1970; *assistant professor, Pediatrics, 1976*

Woodard, Fredrick, B.A. Iowa Wesleyan 1961, M.A. 1971, Ph.D. 1976; *assistant professor, English, 1973 (1976)*

Woodbury, Robert L., D.D.S. Iowa 1973; *adjunct instructor, Family Dentistry, 1975*

Woodruff, Sybil, B.A. Kansas 1916, M.S. Chicago 1919, Ph.D. 1926; *professor emerita, Home Economics, 1940*

Woodworth, George, B.A. Carleton 1962, Ph.D. Minnesota 1966; *associate professor, Statistics, 1971*

Woolson, Robert F., B.A. Delaware 1967, Ph.D. North Carolina 1972; *associate professor, Preventive Medicine and Environmental Health and Statistics, 1972 (1977)*

Wright, Creighton B., A.B. Duke 1961, M.D. 1965; *professor, Surgery, 1976 (1978)*

Wu, Han-Chin, B.S. National Taiwan 1960, M.S. Rhode Island 1965, M.S. Yale 1967, Ph.D. 1970; *associate professor, Materials Engineering, 1970 (1976)*

Wu, Shih-Yen, B.A. Oberlin 1954, Ph.D. Northwestern 1960; *professor, Economics, 1964 (1968)*

Wunder, Charles C., B.A. Washington and Jefferson 1949, M.S. Pittsburgh 1952, Ph.D. 1954; *professor, Physiology and Biophysics, 1954 (1971)*

Wurster, Dale E., B.S. Wisconsin 1942, Ph.D. 1947; *professor, Pharmacy, 1972*

Wycoff, Delane, B.S. Nebraska Wesleyan 1967, M.D. Iowa 1971; *assistant professor, Pathology, 1975 (1977)*

Yager, Robert E., B.A. Iowa State Teachers 1950, M.S. Iowa 1953, Ph.D. 1957; *professor, Secondary Education, 1956 (1967)*

Yamada, Thoru, M.D. Nagoya (Japan) 1966; *assistant professor, Neurology, 1975*

Yang, Chung-Shu, B.S. National Taiwan 1970, M.S. Cornell 1973, Ph.D. 1975; *assistant professor, Computer Science, 1975*

Yans, Javad, M.D. Tabriz Medical School (Iran) 1965; *clinical assistant professor, Internal Medicine, 1973 (1976)*

Yeats, Robert E. B.S. Ithaca 1966, M.A. Iowa 1971, M.F.A. 1977; *assistant professor, School of Music, 1973 (1977)*

Yerington, Kenneth H., B.S.C. Iowa 1958; *adjunct assistant professor, Hospital and Health Administration, 1977*

Yesalis, Charles E., B.S. Michigan 1969, M.P.H. 1972, Sc.D. Johns Hopkins 1975; *assistant professor, Preventive Medicine and Environmental Health and Hospital and Health Administration, 1976*

Yoo, Tai-June, M.D. Seoul (Korea) 1959, Ph.D. California (Los Angeles) 1963; *associate professor, Internal Medicine, 1972 (1975)*

Youm, Youngil, B.S. Utah State 1968, M.S.M.E. Wisconsin 1970, M.S.E.M. 1973, Ph.D. 1976; *adjunct assistant professor, Materials Engineering, 1977*

Young, Eugene W., D.D.S. Iowa 1962; *adjunct assistant professor, Preventive and Community Dentistry, 1975*

Younoszai, M. Kabir, B.S. American (Lebanon) 1956, M.D. 1962; *associate professor, Pediatrics, 1970 (1974)*

Yousefzadeh, David K., M.D. Tehran (Iran) 1965; *assistant professor, Radiology, 1976*

Zach, Gene A., D.D.S. Iowa 1962, M.S. 1967; *professor, Oral Surgery, 1963 (1977)*

Zagel, Milton, M.A. Iowa 1936, Ph.D. 1950; *associate professor emeritus, German, 1946 (1978)*

Zavala, Donald C., B.S. Wooster 1944, M.D. Cincinnati 1948; *professor, Internal Medicine, 1969 (1976)*

Zecher, J. Richard, B.A. Ohio State 1963, M.A. Delaware 1965, Ph.D. Ohio State 1969; *professor, Economics, 1978*

Zellweger, Hans, M.D. Zurich (Switzerland) 1934, *professor emeritus, Pediatrics, 1957 (1958)*

Zemlicka, Pearl, B.S.N.E. Loyola 1942, M.A. Iowa 1958; *assistant professor emeritus, Nursing, 1952 (1975)*

Zenor, M. Dean, B.A. Iowa 1946, M.A. 1947, Ph.D. 1949; *professor, Institute of Public Affairs, 1949 (1959)*

Ziegler, Ekhard E., M.D. Innsbruck (Austria) 1964; *associate professor, Pediatrics, 1973 (1976)*

Ziffren, Sidney E., B.S. Illinois 1934, M.D. 1936; *professor, Surgery, 1946 (1953)*

Zike, Wilbur L., B.A. Houghton 1953, M.D.C.M. McGill (Canada) 1953, D.T.M.&H. London (England) 1960; *associate professor, Surgery, 1969 (1975)*

Zima, William J., B.A. Carthage, 1947, M.A. Iowa 1948; *associate professor, School of Journalism, 1954 (1973)*

Zimmermann, Gerald N., B.A. Brown 1968, M.S. Southern Illinois 1971, Ph.D. Iowa 1973; *adjunct assistant professor, Speech Pathology and Audiology, 1977*

Zlock, Richard W., B.A. Southern Methodist 1960, M.S. Illinois 1976; *associate professor, Statistics, 1976*

Ziska, James H., B.S. College of St. Thomas 1963, M.D. Iowa 1967; *clinical assistant professor, Pediatrics, 1976*

Zito, Anthony J., B.A. DePaul 1964, M.S. Illinois (Urbana-Champaign) 1974; *instructor, Recreation Education, 1978*

Zlatnik, Frank J., B.A. Carleton 1962, M.D. Cornell 1966; *assistant professor, Obstetrics and Gynecology, 1975*

Zopf, Louis C., Ph.G. Iowa 1926, B.S. 1936, M.S. 1939, D.Sc. Nebraska 1954, D.Sc. St. Louis College of Pharmacy and Applied Sciences 1958, D.Sc. Mercer 1972; *professor emeritus, Pharmacy, 1935 (1972)*

Zuber, Ernest V., Jr., B.B.A. Iowa 1961, M.A. 1964, Ph.D. 1966; *assistant professor, Business Education, 1961 (1967)*

Zuehlke, Richard L., M.D. Michigan 1966; *associate professor, Dermatology, 1970 (1975)*

Zurmuehlen, Marilyn, B.S. Ball State 1955, M.A. Haystack Mountain School of Crafts 1963, Ed.D. Pennsylvania State 1970; *associate professor, School of Art and Art History and Early Childhood and Elementary Education, 1974*

Zweng, Marilyn J., B.S. Michigan State 1953, M.S. Wisconsin 1957, Ph.D. 1963; *professor, Secondary Education, 1965 (1972)*

Zynda, Thomas H., B.A. Canisius 1965, M.A. Marquette 1967, Ph.D. Iowa 1975; *assistant professor, School of Journalism, 1975*

Iowa Administrative Code: Board of Regents

The following is extracted from the Board of Regents section of the Iowa Administrative Code. The Code is updated by the Code Editor on a biweekly basis. The reader should consult the Code for any changes made to the Code subsequent to March 15, 1978.

Residence

720–1.4(262) Classification of residents and nonresidents for admission and fee purposes.

1.4(1) General.

Students enrolling at one of the three state institutions shall be classified as resident or nonresident for admission, fee and tuition purposes by the registrar. The decision shall be based upon information furnished by the student and all other relevant information. The registrar is authorized to require such written documents, affidavits, verifications or other evidence necessary to establish the domicile of a student, including proof of emancipation, adoption, award of custody or appointment of a guardian. The burden of establishing that a student is exempt from paying the nonresident fee is upon the student.

For purposes of resident and nonresident classifications, the word "parents" as herein used shall include legal guardians or others standing in loco parentis in all cases where lawful custody of any applicant for admission has been awarded to persons other than actual parents.

1.4(2) Residence for tuition purposes.

Rules regarding residence for admission, fee and tuition payments are generally divided into two categories—those that apply to students who are under the age of eighteen and those who are eighteen years of age or older. The requirements in these categories are different. Domicile within the state means adoption of the state as a fixed permanent home and involves personal presence within the state. The two categories are discussed in more detail below.

1.4(3) Students who are minors.

The residence of a minor shall follow that of the parents at all times, except in extremely rare cases where emancipation can be proved beyond question. The residence of the father during his life, and after his death, the residence of the mother, is the residence of the unemancipated minor; but if the father and the mother have separate places of residence, the minor takes the residence of the parent with whom he lives or to whom he has been assigned by court order. The parents of a minor applying for admission will be considered residents of Iowa only if they have a domicile within the state at the time of the beginning of the semester, quarter or session in which the minor is first enrolled at Iowa State University or the state University of Iowa, or University of Northern Iowa, and if the parents establish such domicile for purposes other than to qualify their child for resident tuition.

A minor admitted before his parents have moved to Iowa may be reclassified as a resident at the beginning of the next semester or quarter in which the student is enrolled after the parents have a domicile in Iowa. A minor student whose parents move their residence from Iowa to a location outside of Iowa shall be considered to be a nonresident at the beginning of the next semester, quarter or session in which the student is enrolled after the date of the parents removal from the state.

A minor under legal guardianship shall not be granted resident status if the primary purpose of the guardianship is to qualify the minor for resident tuition.

A minor living with and being supported by a relative or friend who is a resident of Iowa, but not a minor's legal guardian, may be granted resident status if he has lived with the relative or friend at least three years prior to high school graduation.

1.4(4) Students over eighteen years of age and married students under eighteen years of age.

A student eighteen years of age or older and a married student under eighteen years of age shall be classified as a resident if *(a)* the student's parents were residents of the state at the time such student reached majority or was married and the student is not domiciled in another state, or *(b)* who after marriage or reaching majority has established a bona fide residence in the state of Iowa by residing in the state for at least twelve consecutive months immediately preceding the beginning of the semester, quarter or session. Bona fide residence in Iowa means that the student is not in the state primarily to attend a college; that he is in state for purposes other than to attempt to qualify for resident status.

Any nonresident student who reaches eighteen years of age or is married while under eighteen years of age while a student at any school or college does not by virtue of such fact attain residence in this state for admission or tuition payment purposes.

1.4(5) General facts.

The resident status for admission, fee and tuition purposes of a married student shall usually be determined under these rules irrespective of the classification of the spouse. Married students under eighteen years of age shall be considered to have attained majority as of the date of their marriage.

Persons who are moved into the state as the result of military or civil orders from the government, or the minor children of such persons, are entitled to resident status. However, if the arrival of the parents is subsequent to the time of the beginning of the semester, quarter or session in which the minor child is first enrolled, nonresident tuition will be charged in all cases until the beginning of the next semester, quarter or session in which the student is enrolled.

Dependents of persons whose legal residence is permanently established in Iowa, who have been classified as residents for tuition purposes may continue to be classified as residents so long as such residence is

maintained, even though circumstances may require extended absence of said persons from the state. It is required that persons who claim an Iowa residence while living in another state or country will provide proof of the continual Iowa domicile such as *(a)* evidence that they have not acquired a domicile in another state, *(b)* they have maintained a continuous voting record in Iowa, and *(c)* they have filed regular Iowa income tax returns during their absence from the state.

Ownership of property in Iowa, or the payment of Iowa taxes, does not in itself establish residence.

A student from another state who has enrolled for a full program or substantially a full program in any type of educational institution will be presumed to be in Iowa primarily for educational purposes, and will be considered not to have established residence in Iowa. Continued residence in Iowa during vacation periods or occasional periods of interruption to the course of study does not itself overcome the presumption.

All students not classified as resident students shall be classified as nonresidents for admission, fee and tuition purposes.

A student who willfully gives incorrect or misleading information to evade payment of the nonresident fees and tuition shall be subject to serious disciplinary action and must also pay the nonresident fee for each semester, quarter or session attended.

An alien who has entered the United States on an immigration visa and who has established a bona fide residence in Iowa by living in the state for at least twelve consecutive months immediately preceding the beginning of the semester, quarter or session may be eligible for resident classification providing he is in the state for purposes other than to attempt to qualify for resident status as a student.

Persons in military service (except career servicemen) who listed Iowa as their residence prior to entering service and who, immediately upon release, return to Iowa to establish their residence or enter college, will be classified as residents unless their parents moved from the state while the individual was still a minor.

Change of classification from nonresident to resident will not be made retroactive beyond the semester, quarter or session in which application for resident classification is made.

1.4(6) Guidelines

The following guidelines are used in determining the residence classification of a student for tuition purposes.

a. An unmarried minor student claiming emancipation may be required to file any or all of the following:

(1) a statement from the student describing employment and expected sources of support as a student,

(2) a statement from the student's employer,

(3) a statement from the student's parents verifying nonsupport and the fact that the student was not listed as a dependent on tax returns for the past year and will not be so listed in future years,

(4) supporting statements from persons who might be familiar with the family situation.

A student who is deemed to be emancipated will be expected to meet the same tests as an adult in determining residence classification.

b. A minor student whose parents move from Iowa after the student is enrolled remains a resident provided the student maintains continuous enrollment until reaching the age of majority. Minor students whose parents move from Iowa during their senior year of high school will be considered residents provided that they have not established residence in another state.

c. An adult student who was a former resident of Iowa may continue to be considered a resident provided absence from the state was for a period of less than twelve months and provided residence is re-established. If the absence from the state is for a period exceeding twelve months, resident status would need to be re-established in the same manner as for an initial move to the state, unless evidence can be presented showing that Iowa residence has been maintained according to the established criteria. However, a long-term former resident who returns after an absence of more than one year but less than two years is allowed to regain residency after one year even though a full-time student.

d. The spouse of a person who moved to Iowa for the express purpose of accepting full-time employment is considered a resident effective at the beginning of the next semester or session following their move to the state.

e. An unmarried adult whose parents move to Iowa and who has been a continuous student or a member of the military service since graduating from high school may become a resident at the beginning of the semester provided the student is dependent upon the parents for major financial assistance.

f. An adult who moves to Iowa may be eligible for resident classification at the next registration following twelve consecutive months in the state provided he or she is not enrolled for more than eight credits (four credits during the summer session) in any semester or quarter during that twelve month period.

g. A nonresident student who marries an Iowa resident may be eligible for resident classification at the next registration following the first anniversary of the marriage provided the couple maintains their residence in Iowa during that period.

A nonresident student who marries or is married to a nonresident who is not a student may become eligible for resident classification twelve months after the nonstudent spouse would normally become eligible for resident classification, usually after twelve consecutive months as a nonstudent.

h. An Iowa resident who reaches majority while in the military service will retain resident classification until the conclusion of the regular service tour, assuming that he or she returns to Iowa within one year following discharge. Peace corps and conscientious objector alternate service are treated similarly.

i. The spouse of a person in military service who establishes and maintains Iowa residency according to these regulations during the tour of duty of the person in military service, may also earn residency for the person in military service provided that the person in military service returns to Iowa immediately following his or her tour, and provided that the person in military service has listed Iowa as his or her home of record for at least a twelve-month period immediately preceding release from the service.

j. A career military service person who entered service from Iowa and who may retire to Iowa to go to college, or the minor children of a career military service person who is still on active duty may be granted resident classification if he or she has maintained a valid Iowa residence as evidenced by an official Iowa address as the address of record.

k. If a person who is engaged in a religious vocation is a native Iowan, the time of service in the church is considered the same as required military service or peace corps enlistment and resident classification is granted if he or she immediately returns to the state following the church assignment. A missionary who entered such service from the state and who is on furlough may be considered a resident if he or she is returning to the mission field. If service has been terminated prior to returning to Iowa, the person would be a nonresident if the return to the state was more than twelve months from the termination of the service.

The minor children of an active missionary who was an Iowa resident prior to assignment to the foreign field will be granted resident classification.

l. A person who has been certified as a refugee by the appropriate agency of the United States who enrolls as a student at a university governed by the Iowa state board of regents may be accorded immediate resident status for tuition purposes where he or she:

(1) Comes directly to Iowa from a refugee facility or port of debarkation; or

(2) Has resided in another state for one hundred days or less; and

(3) Provides satisfactory documentation that he or she has an Iowa sponsor.

Any refugee not meeting these standards will be presumed to be a nonresident for tuition purposes and thus subject to the normal durational residency requirement.

m. The following facts and circumstances, although not necessarily conclusive, have probative value in support of a claim for residence classification:

(1) Reliance upon Iowa sources for financial support.
(2) Domicile in Iowa of family, guardian or other relatives or persons legally responsible for the student.
(3) Former domicile in the state and maintenance of significant connections therein while absent.
(4) Ownership of a home in Iowa.
(5) Admission to a licensed practicing profession in Iowa.
(6) Acceptance of an offer of permanent employment in Iowa.

Other factors indicating an intent to make Iowa the student's domicile will be considered by the university in classifying a student.

n. The following circumstances, standing alone, do not constitute sufficient evidence of domicile to effect classification of a student as a resident under these rules:

(1) Voting or registration for voting.
(2) Employment in any position normally filled by a student.
(3) The lease of living quarters.
(4) A statement of intention to acquire a domicile in Iowa.
(5) Continuous presence in Iowa during periods when not enrolled as a student.
(6) Automobile registration.
(7) Other public records, e.g., birth and marriage records.

1.4(7) Review committee.

The decision of the registrar on the residence of a student for admission, fee and tuition purposes may be appealed to a review committee. The finding of the review committee may be appealed to the board of regents.

720–1.5(262) Registration and transcripts–general.

A person may not be permitted to register for a course or courses at a state board of regents institution until any delinquent accounts owed by the person to an institution or any affiliated organization for which an institution acts as fiscal agent have been paid.

A state board of regents institution may withhold official transcripts of the academic record of a person until any delinquent accounts owed by the person to an institution or any affiliated organization for which an institution acts as fiscal agent has been paid.

This rule is intended to implement section 262.9 of the Code.

[Filed12/17/58; amended 1/28/59, 5/26/59, 9/15/59, 10/28/59, 9/20/60, 7/12/67, 8/14/72, 5/16/73, 1/16/75, 6/10/75, 3/19/76, 5/10/76]

Admission Rules Common to the Three State Universities

720–1.1(262) Admission of freshman students.

A student desiring admission must meet the requirements in this rule and also any special requirements for the curriculum, school or college of his choice.

He must submit a formal application for admission and must have the secondary school provide a certificate of high school credits, including a complete statement of the applicant's high school record, rank in class, scores on standardized tests and certification of high school graduation. The applicant must also submit any other evidence such as a certificate of health that may be required by the individual institution of higher learning.

1.1(1) *A graduate of an approved Iowa high school* who has the proper subject-matter background, who is in the upper one-half of his or her graduating class, and who meets specific curricular requirements will generally be admitted upon certification of graduation, if he or she applies for admission.

A candidate who is not in the upper one-half of his or her graduating class may be required to take special examinations and may after a review of his or her entire record and at the discretion of the admissions officers: *(a)* be admitted unconditionally, *(b)* be admitted on probation, *(c)* be required to enroll for a tryout period during a preceding summer session, or *(d)* be denied admission.

1.1(2) *A graduate of an accredited high school in another state* must meet at least the same standards as a graduate of an Iowa high school. The options for admission by probation or tryout enrollment may not be open to these students. Each college reserves the right to demand higher standards from graduates of out-of-state high schools.

1.1(3) *A graduate of a nonapproved high school* must submit all data as required above and in addition must take examinations which will demonstrate his general competence to do successful college work.

1.1(4) *An applicant who is not a high school graduate* must submit all data required above insofar as it exists and must take examinations to demonstrate general competence to do college work. Evidence of specific competence for admission to a given curriculum will also be required.

Examinations for the determination of general competence to do college work are determined by the Iowa committee on secondary school and college relations and are comparable for all three state institutions. Competence established at one is acceptable at all three, but due to different specific curricular requirements, does not guarantee admission to either of the other two.

720–1.2(262) Admission of undergraduate students by transfer from other colleges.

1.2(1) Students from accredited colleges and universities.

Transcripts of record are given full value if coming from colleges or universities accredited by the North Central Association of Colleges and Secondary Schools or similar regional associations. For schools not regionally accredited the recommendations contained in the current issue of the Report of Credit Given by Educational Institutions published by the American Association of Collegiate Registrars and Admissions Officers will be followed.

a. Each applicant shall submit an official transcript bearing the original seal and signature of the official in charge of records from each college or university which the student has attended previously. The student will also submit any other records or letters which the college may require to support his application for admission.
b. A transfer applicant shall be expected to have maintained a "C" average (2.00 based on a "A" grade being 4 points) for all college work previously attempted and not be under suspension from the last college attended. Students who are not residents of Iowa may be expected to have maintained a 2.25 grade index.
c. A student who is below the above standard may be permitted to take entrance examinations. If the applicant successfully completes the examinations he may be admitted on probation.
d. In general, transfer applicants under academic suspension from the last college attended will not be considered for admission during the period of suspension or if for an indefinite period, until six months have passed since the last date of attendance. When eligible for consideration the applicant will be considered as in "c" above.
e. A transfer applicant under disciplinary suspension will not be considered for admission until a clearance and a statement of the reason for suspension if filed from the previous college. When it becomes proper to consider an application from a student under suspension, the college must take into account the fact of the previous suspension in consideration of the application. An applicant granted admission under these circumstances will always be on probation and his or her admission subject to cancellation.
f. Applicants for admission by transfer who do not meet the standards may be denied.
g. Transfer credit from a junior college will not be accepted if that credit is earned after the total number of hours of credit accumulated by this student at all institutions attended exceeds one-half of the number of hours needed for the earning of the baccalaureate degree.

1.2(2) Students from nonaccredited colleges.

A college may refuse to recognize credit from a nonaccredited college or may admit the applicant on a provisional basis and provide a means for the validation of some or all of the credit. The validation period shall not be less than one semester and will ordinarily be a full academic year. The college will specify to the student the terms of the validation process at the time of provisional admission. Each student from a nonaccredited college will be considered on his merits and admission or rejection is at the discretion of the admissions officer.

720–1.3(262) Application deadlines.

Applicants for admission must submit the required applications for admission and the necessary official transcripts and other required documents to the admissions officer of the appropriate college at least ten days prior to the beginning of orientation for the session for which the student is applying. Applications for admission from students who are required to take entrance examinations will not be considered unless the examinations can be completed at least five days before the beginning of orientation. This rule may be waived by the admissions officer only for adequate reasons.

This rule does not apply to the colleges of medicine and dentistry at the university and the college of veterinary medicine at the Iowa State University. Rules applying to these are given in the following: 2.4(262), 2.8(262) and 2.26(262).

All new undergraduate students must complete the American College Testing Program tests, the Scholastic Aptitude Test (CEEB) or the equivalent as determined by the admissions officer before the beginning of orientation for the session in which the student first registers.

Supplemental Specific Rules for The University of Iowa

The following requirements are in addition to those given in regents board rules:

720–2.1(262) Formal application for admission.

All applicants for admission to any college of The University of Iowa must submit a formal application for admission with the required official transcripts and other supporting material as required to the director of admissions. Students may not be registered until they have been issued an admission statement by the director of admissions.

720–2.2(262) Parietal rule.

All unmarried freshmen and sophomore students are required, as a condition of registration at the state University of Iowa for the semester or session, to reside in university residence halls, except that such residence shall not be required of any student beyond the time the student, following the normal course from secondary school to college, would have completed three years at the college level; and except as hereinafter provided. Failure of a student to comply with this condition of registration is cause for denial or cancellation of registration.

2.2(1) Exemptions.

Students subject to the parietal rule may request an exemption for the following reasons:

a. Actual local residence with parent, legal guardian, grandparent, adult sister or brother, or adult aunt or uncle, providing the parietal rules do not apply to both parties concerned.
b. Medical necessity certified in writing by a licensed physician, subject to the approval of the university, which shall establish appropriate standards of general application for the determination of medical necessity.
c. Mandatory religious obligations impossible of performance in the residence halls which the student attests in writing that he or she in fact regularly observes and which a member of the clergy of the student's religious faith certifies in writing are mandatory.
d. Actual local residence in a place of bona fide employment certified in writing by the employer as a necessary condition of employment and in exchange for which the student receives at least one-half of the rent normally charged.
e. Actual local residence in a social fraternity or sorority chapter house or other residential living unit operated and maintained by a recognized student organization exclusively for its members, which residential living unit has been approved by the university as providing those housing, dining and student life facilities which are essential to carrying out the philosophy of higher education contemplated by the establishment of the parietal rule.
f. Actual residence in state University of Iowa residence halls for four semesters. Residence hall residence for two summer sessions is equivalent to one semester.
g. The student making the request is a veteran of armed forces of the United States who has been discharged or released from active duty service.

All requests for exemption from the parietal rule shall be submitted to the University at least thirty days prior to the beginning of the semester or session for which exemption is requested, unless a later time is authorized. The University may require that requests be submitted on prescribed forms and that supporting documents or other evidence be provided, and the burden is on the student to demonstrate to the satisfaction of the university that he or she is entitled to an exemption. The University is authorized to establish further internal procedures for the administration of these rules and to delegate to appropriate university staff personnel any duty or function prescribed herein.

2.2(2) Enforcement.

Failure of a student subject to the parietal rule to comply with this condition of registration is cause for denial or cancellation of registration. If, upon registration or at any time thereafter, a student subject to the parietal rule is found not to be in compliance therewith, including the failure of a student who has been granted an exemption to comply with the conditions thereof, a written notice shall be sent to the student affording a reasonable opportunity to submit proof of compliance or otherwise to show cause why registration should not be denied or canceled or exemption revoked. If the student fails to submit proof or show cause satisfactory to the university, registration shall forthwith be denied or canceled, or exemption revoked, as the case may be. Upon subsequent application and proof of compliance satisfactory to the university and upon payment of all required fees, the student shall be registered or reinstated in accordance with established procedures.

2.2(3) Review.

A student aggrieved by any adverse decision with respect to the administration of the parietal rule may request an administrative review of the decision by the university. Such request shall be made in writing and shall state with particularity the reasons therefor. Pending administrative review, the student's registration shall not be denied or canceled. After review, the decision of the university is final, subject to the student's right to request a review by the state board of regents in accordance with procedures established by the board. Unless otherwise ordered by the board, a student must be in compliance with the parietal rule as a condition of continued registration at the university pending board action on the request for review.

2.2(4) Definitions.

As used herein, the following words shall mean:

a. "University" means the state University of Iowa or the appropriate university administrator to whom any particular duty or function prescribed herein is delegated.

b. "Parietal rule" means the condition of registration at the university established by these rules.

c. "Freshman" student means any undergraduate student registered for nine or more semester hours who has not previously earned twenty-eight or more semester hours of credit toward a baccalaureate degree at the University.

d. "Sophomore" student means any undergraduate student registered for nine or more semester hours who has not previously earned fifty-six or more semester hours of credit toward a baccalaureate degree at the University.

For the academic year 1971-72 the rules shall apply only to freshman students and to sophomore transfer students who have not previously completed at least thirteen semester hours while in residence at the University.

Filed June 18, 1971; amended June 14, 1972, July 17, 1972

720–2.3(262) College of Business Administration.

2.3(1) Application for admission.

Applications for admission to the College of Business Administration should be submitted to the director of admissions.

Applicants are urged to apply as early as possible, since this will give the admissions committee more time to devote to each application. Closing dates for receiving applications will be announced well in advance of the opening date of any session.

2.3(2) Requirements for admission.

For admission to the college of business administration an applicant must have:

a. Completed specific course work as prescribed by the faculty of the college.

b. Attained satisfactory scores on the university's required admission examinations.

c. Maintained a satisfactory grade-point average on all courses undertaken, and on all courses undertaken at The University of Iowa, and on all courses undertaken in business and economics.

Applications from students who have minor deficiencies in meeting grade-point requirements specified above will be reviewed by the admissions committee of the college, and upon favorable recommendation of the committee, such students may be granted conditional or probationary admissions.

Fulfillment of the minimal requirements listed above, however, does not assure admission to the college of business administration. From those applicants who meet the minimum requirements, the admissions committee will select the applicants who, in their judgment, appear to be best qualified.

Filed March 23, 1964; amended March 10, 1966

720–2.4(262) College of Dentistry.

2.4(1) Application for admission.

Address all inquiries regarding admission to the Director of Admissions, University of Iowa.

Applicants are urged to apply as early as possible, since this will give the admissions committee more time to devote to each application. Closing dates for receiving applications will be announced well in advance of the opening date of any session.

Applicants for admission to dentistry are encouraged to complete a program leading to a baccalaureate degree before entering dentistry. Applicants should consider a combined program of liberal arts and dentistry which would qualify them for a baccalaureate degree upon the completion of the freshman year in dentistry. Preference will be given to students who have the baccalaureate degree or who have completed the requirements for the degree in a combined program.

Fulfillment of the specific requirements for admission listed does not insure admission to the college of dentistry. From the applicants meeting the minimum requirements, the admissions committee will select the applicants who in their judgment appear to be best qualified for the study and practice of dentistry.

Each applicant must place on file in the office of the director of admissions the completed application form and an official transcript from each college attended.

The college work outlined below will suffice to meet the minimal academic requirements for admission to the college of dentistry.

The college curriculum must include at least three academic years of accredited work comprising not less than ninety-six semester hours and including specific required science courses as prescribed by the faculty of the college. Electives should be chosen so as to give the applicant a well-rounded educational background.

In order to meet minimum scholarship requirements the applicant should attain a cumulative grade-point average of 2.5. Since the quality of course work in predental science is basic to success in dentistry, special consideration to such college work is given by the admissions committee. The grade-point average is based on The University of Iowa's marking system in which a grade of "A" is equivalent to four points. Other marking systems will be evaluated by the office of admissions and the committee on admissions of the college of dentistry.

Applicants who have completed the requirements for admission to dentistry five or more years prior to seeking admission to this college of dentistry will be considered by the admissions committee only under exceptional conditions.

Preference will be given to applicants who are residents of Iowa, but consideration will also be given to outstanding nonresidents.

Personal interviews will be required of applicants for admission to the college of dentistry. Applicants will be notified when they should appear for the required interviews with members of the admissions committee.

All applicants must complete the dental aptitude tests sponsored by the council on dental education of the American Dental Association. Tests are given three times annually. The University of Iowa is a testing center.

To facilitate early selection, applicants for admission to the college of dentistry are urged to complete the aptitude test no later than October to enable the admissions committee to begin its selection in December.

Accepted applicants are required to make the required deposit within two weeks after notification of favorable action on their applications. This deposit is not refundable but is credited toward the first fee payment. The applicant who fails to make the deposit within the time specified forfeits his or her place in the entering class.

Applicants accepted for admission are required to submit a satisfactory physical examination report to the university student health service within two weeks following notification of acceptance.

All applicants must also complete, through student health service, an X-ray film of the chest and a successful vaccination against smallpox prior to registration.

2.4(2) Advanced standing.

Applications for admission with advanced standing are handled as individual cases.

Filed 3/10/66; amended 3/19/76

720–2.5(262) College of Engineering.

Address all inquiries regarding admission to the Director of Admissions, University of Iowa, Iowa City, Iowa.

Closing dates for receiving applications will be announced well in advance of the opening date of any session.

2.5(1) Admission of freshman students.

The applicant must submit a formal application for admission and must have the secondary school provide a certificate of high school credits, including a complete statement of the applicant's high school record, rank in class, scores on standardized tests and certification of high school graduation. The applicant must also submit any other evidence such as a certificate of health that may be required by this university.

Each applicant must have attained satisfactory scores on the university's required admission examinations, maintained a satisfactory cumulative grade-point average, achieved satisfactory rank in graduating class, and successfully completed all prerequisite courses. The university with the approval of the state board of regents shall establish and periodically review specific minimum requirements for admission to the college of engineering.

Among the items to be so determined are test score, grade-point average, class rank and prerequisite courses. These specific determinations will be published in the university catalog.

From applicants who do not meet minimum admission requirements, the director of admissions may after a review of the applicant's record: *(a)* Admit unconditionally, *(b)* admit on probation, *(c)* require enrollment for a tryout period during a preceding summer session or *(d)* deny admission.

2.5(2) Admission of undergraduate students by transfer.

The applicant must submit a formal application and official transcript of college work. Each applicant should have:

a. Maintained satisfactory progress in mathematics.

b. Attained satisfactory scores on the university's required admission examinations.

c. Maintained a satisfactory cumulative grade-point average on all college work undertaken.

From applicants who do not meet the above requirements, the director of admissions will review individual records and may offer probationary admission.

Filed March 23, 1964; amended March 10, 1966

720–2.6(262) Graduate College.

Graduates of any college or university accredited by regional accrediting associations may, if the academic record is satisfactory, be admitted to the graduate college. Admission to the graduate college is not the equivalent of acceptance as a candidate for an advanced degree. Such acceptance is given usually after the completion in residence of work at the university and upon recommendation of the major department and approval by the dean of the graduate college. The acceptance of a student as a degree candidate is determined upon the merits of each individual case.

A student who is within four semester hours of having satisfied all the requirements for the bachelor's degree at The University of Iowa may be given a tentative admission to the graduate college.

720–2.7(262) College of Law.

2.7(1) Application for admission.

Address all inquiries concerning admission to the Director of Admissions, University of Iowa, Iowa City, Iowa. Beginning students may enter the college of law only in the summer session or the fall semester. Closing dates for receiving applications will be announced well in advance of the opening date of any session.

To be considered for admission, an applicant should have attained a cumulative grade-point average of at least 2.3 on all college work undertaken. The grade-point average is based upon The University of Iowa's marking system in which a grade of "A" is equivalent to four points. Other marking systems will be evaluated by the office of admissions.

Applicants for admission must present a baccalaureate degree from an approved college or university prior to commencing work in the college of law.

Each applicant for admission must take the Law School Admission Test administered by the Educational Testing Service, Princeton, New Jersey, and have his score forwarded to the college of law. The test is given several times per year and may be taken at numerous locations in the United States and throughout the world. Applicants are urged to take the test in the fall or winter preceding the fall semester for which they are making application. Except upon a showing acceptable to it, the admissions committee will not consider applications from students who fail to take the test prior to the June 1 preceding the fall semester in which they wish to enter.

Fulfillment of the specific requirements for admission listed above does not insure admission to the college of law. From the applicants meeting the minimum requirements, the admissions committee of the college of law will select those applicants who, in their judgment, appear to be best qualified for the study and practice of law. The law admissions committee may require personal interviews of applicants.

2.7(2) Admission with advanced standing.

A transfer student may be eligible for admission if he or she *(a)* has attended a school approved by the Association of American Law Schools; *(b)* is in good standing at the time of his or her withdrawal (evidenced by a letter from the dean of the school from which he or she is transferring); *(c)* meets the admission requirements for beginning students; and *(d)* has done substantially above average work in the law school attended. Where an applicant has completed more than one year of law study, advanced standing will be permitted only in exceptional cases. Applicants for admission with advanced standing should comply with the procedures required for admission to the first-year class.

Filed 5/22/64; amended 9/18/64, 12/14/66, 11/17/72

720–2.8(262) College of Medicine.

2.8(1) Application for admission.

Address all inquiries regarding admission to the Director of Admissions, University of Iowa.

Applicants are urged to apply as early as possible, since this will give the admissions committee more time to devote to each application. Closing dates for receiving applications will be announced well in advance of the opening date of any session.

Fulfillment of the specific requirements for admission listed below does not insure admission to the College of Medicine. From the applicants meeting the specific requirements, the admissions committee of the college of medicine will select those applicants who in their judgment appear to be best qualified for the study and practice of medicine.

Prior to entrance an applicant must:

a. Have received the baccalaureate degree; or

b. Have completed three years of a combined baccalaureate-medicine curriculum which qualifies the applicant to receive the baccalaureate degree on completion of the first year in medicine; or

c. Have completed three years of a baccalaureate program which includes the general graduation requirements of the college of liberal arts of The University of Iowa for the combined baccalaureate degree.

Each applicant must place on file in the office of the director of admissions the completed application form and an official transcript from each college attended.

The college work as outlined below will suffice to meet the minimal academic requirements for admission to the college of medicine.

Applicants who have completed the baccalaureate degree and required courses five or more years prior to seeking admission to this college of medicine will be considered by the admissions committee only under exceptional conditions.

The college curriculum must include at least three years (equivalent to ninety-six semester hours) including specific required science courses as prescribed by the faculty of the college.

Students planning to study medicine should bear in mind that other college work is required in addition to prerequisite sciences because it offers an opportunity to secure a well-rounded education, which is of special importance to those entering the medical profession. In the selection of applicants, preference will be given to those who give evidence of having obtained such a broad education.

To be considered for admission, an applicant must have attained a grade-point average of at least 2.5 for all college work undertaken. As the quality of work in premedical science is basic to success in medicine, special attention will be given by the admissions committee to grades in science. The grade-point average is based upon The University of Iowa's marking system in which a grade of "A" is equivalent to four points. Other marking systems will be evaluated by the office of admissions and the committee on admissions of the college of medicine.

Preference will be given to applicants with high scholastic standing who are residents of Iowa, and consideration will also be given to outstanding nonresidents. Applicants for admission are required to take the medical college admissions test which is administered for the Association of American Medical Colleges. Applicants are requested to complete this test in May or October of the year preceding that for which they are applying for admission. Students may make arrangements to apply for this examination through the university examination service, The University of Iowa.

Personal interviews will be required. Applicants will be contacted for the appointment for the required interview. Applicants accepted for admissions are required to submit a satisfactory physical examination report to the university student health service within two weeks following notification of acceptance.

All applicants must also complete, through Student Health Service, an X-ray film of the chest and successful vaccination against smallpox prior to registration.

2.8(2) Admission to advanced standing.

If their work preparatory to entering a college of medicine would have met entrance requirements of this college, students from other approved medical colleges may be admitted to advanced standing according to the following conditions:

Only applicants of high scholastic standing will be considered.

They must present certificates showing that they have satisfactorily completed courses equivalent to those already pursued by the class they wish to enter.

The committee on admission to advanced standing will decide in each case whether examinations in the various subjects will be required.

Applications will be considered only upon receipt of a statement from the dean or registrar of the college from which the applicant comes, showing the actual amount of time the student has spent in the study of medicine, the courses taken, and the grades received, together with a statement of the work preparatory to entering upon the course in medicine.

No advanced standing will be granted to students from other than approved medical schools. Students may be granted subject credit upon recommendation of the head of the department concerned, for work taken in other than medical schools.

2.8(3) Unclassified students.

Applicants for admission to the College of Medicine who are not candidates for a degree but who desire to register for special subjects will be admitted to any lecture or laboratory course only upon complying with all the regular requirements for admission to such course, or by action of the faculty upon recommendation of the professor in charge of the course.

Filed 3/23/64; amended 3/10/66, 3/19/76

720–2.9(262) College of Nursing.

Applications for admission to the college of nursing should be submitted to the Director of Admissions, University of Iowa, Iowa City, Iowa. Applicants for admission to the undergraduate program in nursing must present a minimum of thirty semester hours completed in an accredited college. For admission to the college of nursing an applicant must have:

1. Completed specific coursework as prescribed by the faculty of the college. The director of admissions will provide a list of the coursework required.

2. Completed the American College Tests.

3. Performed satisfactorily on all courses undertaken.

Applications from students who have minor deficiencies in meeting grade-point requirements specified above will be reviewed by the admissions committee of the college, and, upon favorable recommendation of the committee, such students may be granted conditional or probationary admissions.

Fulfillment of the minimum requirements listed above, however, does not assure admission to the college of nursing. From those applicants who meet the minimum requirements, the admissions committee will select the applicants who, in their judgment, appear to be best qualified.

Filed July 18, 1962; amended July 22, 1965, November 17, 1972

720–2.10(262) College of Pharmacy.

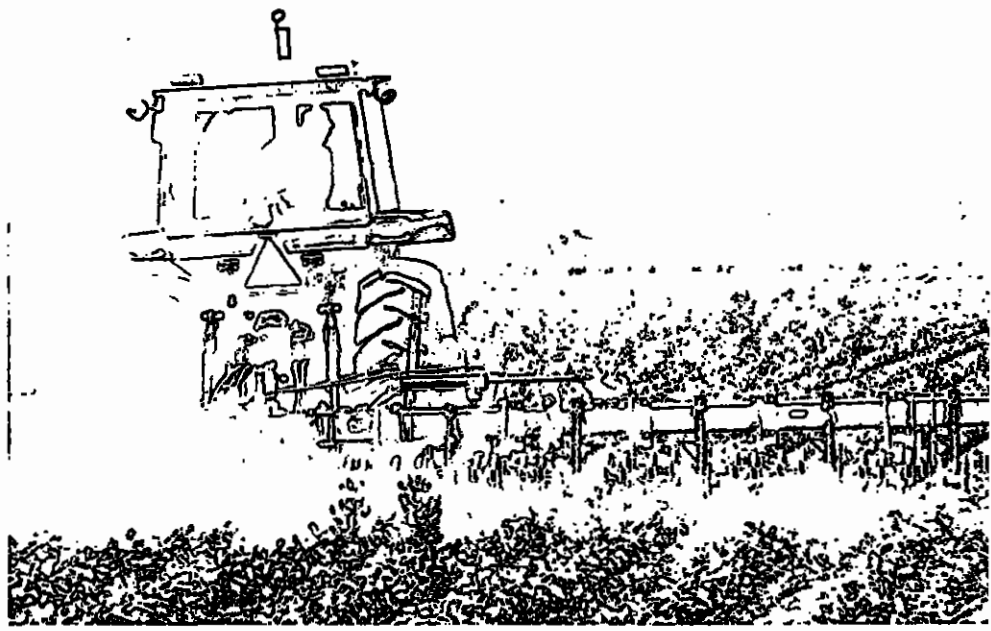
2.10(1) General basis for admission.

Fulfillment of the specific requirements for admission does not insure admission to the college of pharmacy. From the applicants meeting the specific requirements, the admissions committee will select those applicants who in their judgment appear to be best qualified. Applicants for admission to pharmacy should have graduated from an approved high school or have an equivalent amount of training.

2.10(2) College work.

The college work as outlined below will meet the minimum academic requirements for admission to the college of pharmacy. The minimum should include thirty-two semester hours of college level work exclusive of credit in military and air science and physical education. The thirty-two semester hours must include:

Communications skills. Applicants must have demonstrated satisfactory achievement in communication skills according to the requirements of the college of liberal arts at the state University of Iowa. Applicants from other institutions may meet this requirement by presenting six semester hours of credit in English composition and rhetoric and two semester hours of credit in speech or an eight-semester-hour year course in communication skills.



Inorganic chemistry and qualitative analysis, eight semester hours.

College mathematics, eight semester hours.

Physics or zoology, eight semester hours.

Students from other institutions may substitute a comparable eight-semester-hour course in biology in lieu of zoology.

Military or air science (if available) zero to two semester hours.

Students who present minor deficiencies in meeting the above requirements may be admitted to the college of pharmacy upon the recommendation of the dean of admissions and the college of pharmacy.

2.10(3) Scholarship and application deadline.

To be considered for admission to the College of Pharmacy, students must have earned a 2.0 or "C" average on all collegiate work undertaken. The minimum grade-point average of 2.0 is based on the state University of Iowa's marking system in which the grade of "A" is equivalent to four points. Applications for admission and the required official transcripts should be filed before March 1 for the class to enter Pharmacy in September.

2.10(4) Required tests.

Applicants for admission are required to take the American College Testing Program test.

2.10(5) Current requirements.

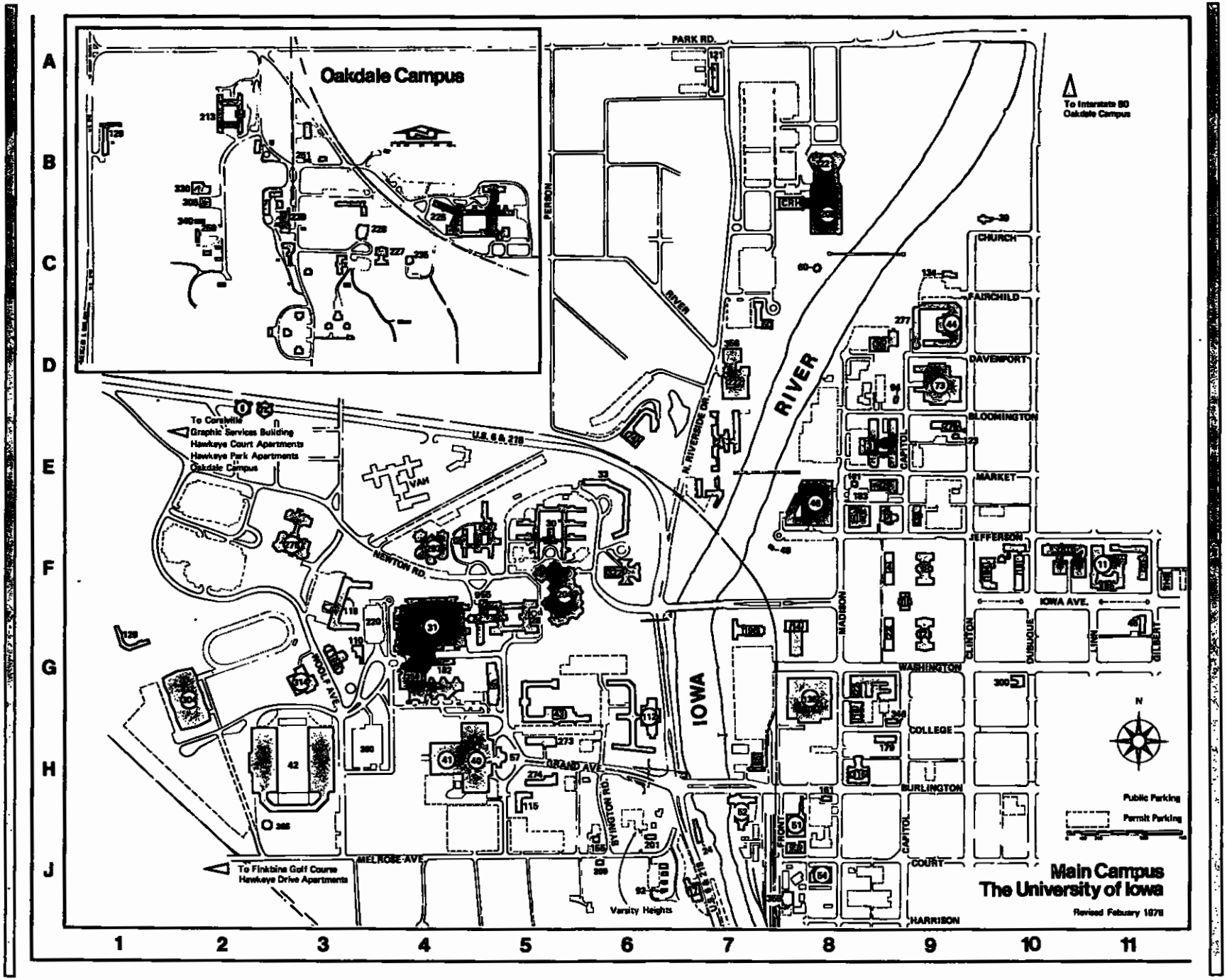
Applicants who have completed work in a College of Pharmacy accredited by the American Council on Pharmaceutical Education may, if their college academic average is acceptable, be admitted and granted advanced standing toward the degree of Bachelor of Science in Pharmacy.

720–2.11(262) College of Liberal Arts.

Applicants for admission to Liberal Arts must meet the rules that are common to the three state institutions in Iowa as listed in 1.1(262), 1.2(262) and 1.3(262).

720–2.12(262) College of Education.

Students at the University desiring professional work in education are registered in the College of Liberal Arts or the Graduate College. Requirements for permission to take teacher-training courses are listed in the university catalog.


Oakdale Campus
PARK RD.
PERSON
RIVER
N. RIVERSIDE DR.
To Interstate 80
Oakdale Campus
CHURCH
FAIRCHILD
DAVENPORT
BLOOMINGTON
MARKET
JEFFERSON
IOWA AVE.
MADISON
CLINTON
DUBUQUE
LINN
GILBERT
WASHINGTON
COLLEGE
BURLINGTON
COURT
HARRISON
CAPITOL
FRONT
IOWA
To Coralville
Graphic Services Building
Hawkeye Court Apartments
Hawkeye Park Apartments
Oakdale Campus
U.S. 6 & 218
NEWTON RD.
WOLF AVE.
GRAND AVE.
SYLVAN RD.
MELROSE AVE.
To Finkbine Golf Course
Hawkeye Drive Apartments
Varsity Heights
VAH
N
Public Parking
Permit Parking
Main Campus
The University of Iowa
Revised Febuary 1978
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